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ABSTRACT

This is the final report of the evaluation of the DIALIB project--an investigation of the public library as a linking agent to major scientific, educational, social, and environmental data bases. The report is presented in seven sections and four appendices as follows: Section I provides an introduction to the study and a brief summary of the findings; Section II is a background section which describes the national background against which this study was connected; Section III is a discussion of the third year of the DIALIB project; Section IV compares the three years of the DIALIB project; Section V presents conclusions regarding online searching in the public library; Section VI describes problem areas which any library considering online searching must confront; Section VII discusses three areas in which additional research is needed; Appendix I contains statistical tables describing the DIALIB data; Appendix II is a study on the cost of online bibliographic searching in the DIALIB libraries; Appendix III is a "mini-study" of repeat users of DIALIB services; Appendix IV is another mini-study comparing local vs. network search systems in the DIALIB project. (Author)

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INVESTIGATION OF THE PUBLIC LIBRARY AS A LINKING AGENT TO MAJOR SCIENTIFIC, EDUCATIONAL, SOCIAL, AND ENVIRONMENTAL DATA BASES: FINAL EVALUATION REPORT

Colin K. Mick

September, 1977

Conducted for:

Lockheed Missiles & Space Company, Inc.*

and

Division of Science Information,
National Science Foundation*

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Michael Cooper and Nancy DeWath of the U.C. Berkeley School of Library and Information Studies conducted two cost studies for ACR as part of this project.

Alice E. Ahlgren served as project manager for the first two years of the DIALIB evaluation and prepared the two-year interim evaluation report. Carol Masinter coordinated data collection for the third year of the report and prepared much of the background information for the final report.

Our thanks go to the many librarians in San Mateo and Santa Clara counties who participated in the study.

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FOREWORD

This is the final report of the evaluation of the DIALIB project--an Investigation of the Public Library as a Linking Agent to Major Scientific, Educational, Social and Environmental Data Bases. It was conducted by Applied Communication Research, Inc. with the support of the National Science Foundation and Lockheed Missiles & Space Company, Inc.*

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Appendix I contains statistical tables describing the DIALIB data.

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Appendix IV is another mini-study comparing local vs. network search systems in the DIALIB project.

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I. INTRODUCTION

In 1974, Lockheed Information Systems received a grant from the National Science Foundation to conduct a study to determine the viability of providing access to major online bibliographic databases to the public via the public library, and to assess the impact of such a service on the library. The Lockheed DIALOG Information Retrieval Service was used for online retrieval. Applied Communication Research, Inc., served as evaluator for the project. A detailed description of the project is provided in the interim two-year reports [1,18] of this project.

A two-year project was initially planned in which the libraries would offer access to the data bases free of charge during the first year but would have to recover 50 percent of the search costs during the second year. At the end of the second year it was decided to extend the project for a third year in which the libraries would recover all the retrieval service costs (terminal connect time and printing charges).

The project was carried out in cooperation with the Cooperative Information Network--a network of public and private libraries in San Mateo and Santa Clara counties in California. Four public libraries participated in the first two years of the project--the Redwood City Public Library, the San Jose Public Library, the San Mateo County Library and the Santa Clara County Library. The Redwood City Public Library withdrew from the project at the end of the second year, and the Santa Clara County Library withdrew shortly thereafter.

The first year of the project was primarily a learning period. The service was initially advertised quite widely, and no limits were attached to its use. The free search policy generated a significant search volume and librarians found themselves hard-pressed to cope with it. Since patrons did not pay for the searches, the librarians spent little time in preparation and devoted most of their efforts to working online with the data bases. The librarians "learned" the individual data bases by conducting searches on them. This also tended to increase the online connect time. The large number of search requests proved to be a signficant drain on the staff resources of the participating libraries. The initial response was to immediately cut all publicity efforts. One library attempted to withdraw from the project but was finally able to continue after a local university provided staff assistance for searching (the service was heavily used by university students).

All four libraries chose to provide the 50 percent support requirement through the imposition of patron fees. The imposition of fees generated an abrupt drop in search request volume (although the volume gradually increased after the initial drop). In the second year the search style changed significantly. Staff time per search increased (primarily in presearch preparation), the connect time per search decreased, and the number of citations increased. The participating libraries continued the policy of no publicity established during the first year, even though the search volume had dropped significantly and no longer posed a significant threat to staff time.

Most of the third year of the project was conducted with only two libraries. Both libraries again chose to pass all search costs on as patron fees. The search volume remained relatively constant--well below what the librarians felt was the "stress level", but the policy of no publicity continued.

On this page we will note briefly some of the major findings of the study. A more detailed discussion of these findings can be found in Sections V and VI of the report. Specific subsections are indicated for each finding.

There is a market for existing data bases. The market is composed primarily of relatively sophisticated information users--graduate students, technical and managerial professionals, etc.--who do not have other convenient means of access to online searching. (V.1)

The public library is quite capable of meeting this market. Many librarians became quite accomplished searchers. As generalists, they lacked subject specialization, but this did not appear to be a major problem. (V.2)

Supporting the service financially is a major problem. Both primary approaches (free and pay) have advantages and disadvantages. The fee-for service question is currently a major philosophical issue within the public library community. (V.3)

Establishing limits to the service is a major problem and one that should be considered very carefully by any library considering offering online searching. (VI.1).

Development and implementation of an online reference service requires a substantial commitment in terms of staff time. Failure to adequately plan for staff time can lead to major problems. (VI.2)

Staff attitudes toward, and support for, the online search service are a major determinant of success. The support and commitment of the library director and head reference librarian are crucial to success. (IV.2, VI.3)

Promotion and education--both for library staff and for users--is essential. Failure to promote the service may deny some groups access to it. Failure to educate may create false illusions. (VI.5)

Adequate searcher training is essential. This entails not only system training, but also data base training. (VI.6)

Adequate documentation--both of the search system and the data bases--is essential. This requires investment on the part of the library. (VI.7)

A critical mass of searches is necessary to maintain searcher competence. Most librarians felt 5-10 searches per month were needed to maintain search skills for a particular data base. (VI.8)

II. BACKGROUND

The DIALIB project was conducted against the background of a turbulent, rapidly changing public library system. To some extent, this project reflected the current turmoil in public libraries. Because it both affected and was affected by this turmoil, it is important to describe the overall background or setting within which the project was conducted. In the following pages we have tried to describe some of the major forces acting on public libraries. We acknowledge that it is not exhaustive and that it has been developed from "outside" the public library system.

II.1 The Information Revolution

Library services are now in the midst of a revolution*; the revolution is caused in part by the new discipline of information science as it is applied to the traditional field of library science, and the new emphasis on technical training of librarians. Advances in computer, information, and communications technology lie behind the library revolution, because the computer and associated communication links are the tools that make the transformation of the library possible. Linking of library patrons to computer data bases is one example of how computer and communications technology can be applied to expand traditional library services.

Innovations, however, are often slow in gaining widespread acceptance, because they must establish their value against "tried and true" methods. Other factors play a role in slowing the adoption of an innovation; one significant barrier to innovativeness is an unfavorable financial position. As Everett Rogers has indicated in his study of the diffusion of innovations "wealth and innovativeness appear to go hand-in-hand." [22] The public library's funding and resources are its major constraints.

Yet, it is the unfavorable financial position of public libraries that makes it imperative for them to use tools offered by modern technology, for these tools may offer improved efficiency and quality of service. Furthermore, a modern, innovative library may be able to attract and keep the support of the population it serves, and to play a central role in the life of its community.

* By revolution we mean "a complete, pervasive, usually radical change in something." We use the term to refer to a change to new technology (e.g. Industrial Revolution) rather than violent overthrow. Others might prefer a term like "change" or "metamorphasis".

II.2 The Budget Problem

II.2.1 The Information Explosion

Much has been written about the "information explosion"--the "unprecedented accumulation and congestion of information" in all fields, especially in science and technology. [3] The volume of published scientific and technical information alone, for example, has been doubling every 15 years. In 1975, 40,000 books were published [19]. Libraries are expected to keep up with the flood of information and provide access to it, and to do so without any substantial increase in their budgets. While the public library of 50 years ago could provide access to almost everything of importance that was being published in a variety of fields, today any single public library can afford to offer only a very small segment of the whole.

II.2.2 The Effect of Inflation on Libraries

Public libraries must meet their costs of rising salaries, costs of materials, periodical subscriptions and books with usually a small (1% to 1.4%) portion of the local city budget. Although the total amount of library expenditures has increased from $6 to $30 million in the period from 1950 to 1968 and the percentage allocated to libraries has remained stable, Cooper [6] notes that

> "the only difficulty in such a funding analysis comes when one sees that cities in general are facing severe financial problems, and that, even though libraries will continue to receive their 1% of the funds, the total amount of funds available in constant dollars may decrease or competition for the available funds will increase to a point where librarians may not be able to sustain their position."

The financial problems of America's cities and their effect on the public library is a theme to which commentators on the library situation return again and again. Apparently, whenever there is competition for funds, library funds will be the first "luxury" to be dropped from the budgets. Although administrators take a token interest in their survival, libraries are not a number one priority compared to other urban services.

The financial bind is not unique to public libraries. The special library within a corporation is also suffering from rising operating costs and tight budgets. A recent report by A.T. Kearney indicates that the percentage of funds allocated to special libraries is currently at a low level. "...two-thirds of the manufacturing firms expend less than 0.05% of sales revenue on scientific and technical information (STI) activities..." Just as with local government expenditures, STI activities within industry are "highly vulnerable to cutbacks and budget reductions during the prevailing economic recession." [15]

II.2.3 Sources of Support for Libraries

Local taxes and in some cases, state taxes, are the main source of support for public libraries; federal aid to libraries exists, but it has always been small and in recent years the amount of such aid has diminished. A recent NCLIS report shows that as of 1975, local funding supplies 82.1% of support for public libraries, state support supplies 12.9% and federal support 5%. [26] Legislation such as the Library Services Act of 1956, for example, authorized Congress to appropriate money to help states establish public libraries in rural areas. This Act, as amended in 1964, has helped in construction of library buildings, in the establishment of library networks, and has helped to support the provision of library services to groups with special needs, e.g., the handicapped or minority groups.

As Wright [34] comments:

"This constant battle for meager crumbs from the federal budget (approximately 2.5 percent of this year's education budget) has had its effect on library supporters and their Congressional champions. When substantial amounts of energy must be consumed each year just fighting for support in Washington, it leaves little strength or opportunity for creativity or redirection."

II.2.4 Unfavorable Financial Position and Innovation

The impact of the public library's economic situation to its role as a linking agent is revealed through interviews with the librarians involved in the DIALIB experiment. Although many libraries have been actively engaged in linkage activities for years, other libraries perceive such activities as a completely new function, rather than a new perspective on an old one. The public librarian is wary of taking on new untested roles that may require additional investments of staff time to provide service and training, or, if the service is to be paid for by the users, in billing and collecting. Often, public librarians feel that they do not have the necessary resources to carry out their traditional functions adequately, let alone take on new functions.

Without adequate financial support, libraries cannot satisfy users, introduce new programs, or upgrade existing ones. In such an environment, the public library may be unable to take advantage of innovations which might help them to do existing tasks more efficiently and economically.

III.3. What is the Function of the Public Library?

III.3.1 Pressures to Provide Services to the General Public

In addition to their budget problems, public libraries are also facing image and identity problems. Their image is generally one of passivity and nonaggressiveness. They face pressures from various special-interest groups to provide special kinds of service. With their limited budgets, they cannot hope to be "all things to all people", so the public library must decide which segments of the public it is meant to serve and how extensive the service should be. Ultimately, it is the taxpayer who must decide, since it is the taxpayer's money that supports the public library.

Wright [34] has indicated that there is a need for a "complete reassessment of the role of the public library in the United States today" and an opportunity for the reassessment is at hand. The White House Conference on Library and Information Services [33] will develop recommendations for the further improvement of the nation's libraries and information centers and their use by the public. The Conference will bring together businessmen, educators, politicians, journalists, and minority representatives as well as information scientists and librarians to discuss this crucial problem.

III.3.2 The Public Library's Perception of Its Mission

Two studies commissioned by the National Advisory Commission on Libraries are reported in Libraries at Large. [16] These reports "shed light on what the library profession itself thinks about the users and uses, present and potential, of public libraries in the shifting society of the United States." Although public libraries vary both in size and operating philosophy, these studies revealed many similarities. A majority of the libraries surveyed, for example, felt that the public library had not responded fully enough or promptly enough to the needs of the disadvantaged. The librarians noted a change in the past decade towards a more actively "people-oriented" service, through the establishment of outreach programs in the community. The survey reveals that the public library of 1967 often served as a "linking agent" to other agencies in areas such as adult education, literacy programs, antipoverty programs, health and welfare and employment. Respondents listed the scientific, technical and business communities as subsets of library users that the public library did not successfully serve.

However, one impression conveyed by the surveys is that many public libraries, if asked to choose, would currently rate provision of services to "under-privileged" groups over new services used principally by business and industry. The public library may be seeking to temper the phenomenon of the "Mathew Effect": They would like to give more to those that have less, rather than heap additional benefits on those that are already well-off. As Blake and Perlmutter suggest, [4] perhaps the public library

should "substitute new services to new populations for traditional services to populations which can and do find them outside the library." However, the appropriateness of a particular service depends on the nature of the community the public library is serving. The San Francisco Bay Area, for example, has a large scientific, technical and business population who can make use of the scientific and technical data bases currently available. Other communities might find that the demand for these data bases is very small. Even in these communities, however, the concept of the library linking users to computer data bases is a sound one. If data bases that addressed the information needs of the poor or culturally disadvantaged were available, many public libraries might welcome the opportunity to provide the necessary link. As the NACL survey showed, libraries are currently linking users to the services of social agencies in the community.

In San Mateo County, for example, the Community Information Project provides online access to a database containing information on social services available in the county.

II.4 The NCLIS Report

One of the most significant documents relating to national policy towards library and information services is the recent report from the National Commission on Library and Information Science [26]. Their comments on the public library are of great interest, and worth quoting in full.

> "Public libraries in the U.S. are facing new problems with respect to their internal operations. Financial support is not keeping pace with increasing costs; and the libraries are under increased pressure to give service in more breadth and depth to a wide range of users who vary in age, education and interests. They are limited in their ability to tap new technological sources of information and they are constrained from upgrading their present manual methods to automated systems. In many instances, these problems have caused the public library to affiliate with technical processing cooperatives, to depend on larger libraries for backup, to expand interlibrary relationships, and to join public library systems and networks outside their local jurisdictions."

> "More than any other type of library, public libraries are close to the people in the communities in which they exist. Public libraries, including the smallest, are the backbone of the library system in America, and are the potential windows on any future nationwide network. Therefore, a great deal depends on the strength of their human and material resources and on their ability to undertake new programs of value to their constituents. Financial studies indicate that local sources of revenue will be insufficient to meet the public's demand for new programs, new construction and new staff. The public library, particularly in large metropolitan centers, is in a state of flux, and major changes in its funding and operating philosophy must occur if it is to serve its community effectively in the future."

The NCLIS report identified two problem areas -- financial support and identity, but found a "silver lining in the clouds", in that libraries are entering into cooperative agreements with other libraries. Such cooperation is a vital first step in the development of a synergistic national information network that NCLIS envisions.

II.5 Potential Solutions

II.5.1 Survival Criteria

The public library is facing problems both in terms of financial support and in terms of its function as a service institution. If it is to survive, the public library must:

(1) become a more active institution, increasingly reaching out to determine the needs of current and potential user groups, and using all available resources to meet those needs. In so doing, it may increase its value in the eyes of the community, and build support for additional funding.

(2) It must tap new technological sources of information, as the NCLIS report stresses, and use available technology to automate appropriate operations thus saving costs and improving service. It must expand existing cooperative efforts with other libraries to share resources and take advantage of the economies of scale inherent in the use of computers for library operations.

(3) It must seek out new sources of financial support, including the investigation of the possibility of user charges for some services.

(4) It must be willing to consider new roles that go beyond the traditional.

II.5.2 The Library and the Computer

The computer holds forth a double promise to the library. It may

(1) help alleviate the economic pressures on the library through automation of labor-intensive "housekeeping" tasks in libraries, and

(2) be the opening wedge of much more widespread use of computers in libraries, not only for housekeeping tasks, but for example, as a reference tool, content processor or in other experimental applications.

In fact, providing a link to data bases can be seen as part of a "package" that includes automation of other library operations as well. The package includes library networks, centralized processing and production, automatic acquisition, circulation and generation of union lists. Once one of these innovations has been accepted, others may follow. The terminals are in place, the computer is running, and the technology has become integrated into library operations and philosophy. The library which has most successfully adopted the role of "linking agent" in the DIALIB

experiment (at least in the last year) was the San Jose Public Library, which is currently engaged in automation of circulation and records, and which has become a member of the Ohio College Library Center (OCLC) network.

Although computerization appears promising, many have demanded to see hard data on cost-savings. Ellsworth Mason, for example, feels that computerization has been "launched in libraries for personal and institutional ego reasons" with "little critical evaluation and no cost justification." [23] Simmons [23] admits that at the beginning of the 1970's "it is difficult to find any computer applications which are performing essential library operations as effectively as and at less cost than they were performed by efficient traditional methods."

It is important, however, that one be aware of the long time required for the successful completion of the innovation process. We are now in the very early stages of exploring the potential of the computer in the library. A great deal of work remains to be done before the computer is successfully integrated into the U.S. library system. It is important to assess these explorations very critically.

II.5.3 Library Cooperation

The cost-savings of cooperative efforts among libraries are perhaps more easily demonstrated, although Mayhew has indicated that "the cost benefit factor has been ignored in most literature of networking." [20] These networks, many of which have been in existence for a number of years,- may be simply informal agreements among libraries to share materials, formal contracts with a centralized processing agent (such as the Library of Congress) or an elaborate communication network of terminals and computers linked by high speed communication lines. The San Francisco Bay area has a number of operational library networks--for public libraries only and for both public and private libraries. [30] All libraries in the DIALIB experiment were members of the Cooperative Public Library Systems (a public library network.) The San Jose and Cupertino libraries are members of a second public library network--the South Bay Cooperative Library System. In addition, all libraries in the DIALIB experiment belong to the Cooperative Information Network (a network for both public and private libraries.)

More extensive and better library cooperation may be the only feasible solution to the information explosion. Susan Martin writes in her report on Library Networks of the "wider library", which through interlibrary lending, photocopying, reciprocal borrowing privileges and other methods attempts to provide a full range of materials to its users. [19]

A group of libraries banded together into a network will have already made an initial investment in computer terminals. Their staffs will be psychologically prepared to extend their reference services outside of their own collections, to the collections held mutually by the network, or to the data bases maintained by such organizations as Lockheed and SDC, or

to data bases that have not yet come into existence. The library groups can negotiate with these data base producers as a group, or can perhaps funnel all requests for searches to one main node of the network thus generating a sufficient volume of business.

The library that belongs to a network has a greatly increased power to meet the need of its constituents. It has access to the resources of many libraries and to data bases that no single library working alone could possibly provide. The idea of libraries reaching out beyond themselves to provide reference service is not a new one and cooperative efforts among libraries have been in existence for decades. However, computer and communications technology can increase the range and sophistication of such networking arrangements.

II.6 Conclusions

We have discussed the problems confronting public libraries, some of the changes that the libraries are making in response, and the technology and organizational arrangements that will facilitate change. It is against this dynamic background that the DIALIB project was conducted. The forces and trends we have discussed were all active and visible in the public libraries participating in the experiment. In some ways, the DIALIB project might be seen as a microcosm of events and activities occurring throughout the public library system.

III. WHAT HAPPENED IN THE THIRD YEAR?

The first and second years of the DIALIB project have been described in great detail in previous reports [1, 18]. Rather than replicate this discussion,we shall focus on the third year of the project.

The third and final year of the DIALIB project was significant in that it dealt with the transition to "full pay" where the client was required to pay for the full marginal costs (computer connect time and offline printing) for each search. The libraries covered all other costs (with the exception of terminal rental, which was paid for by the NSF project).

The description of the third year is presented in four parts: a discussion of the general circumstances surrounding the third year of the project; a discussion of the search service (including patrons, the searches, and patron feedback on the searches); a discussion of library reactions and impressions to the third year of the project, and observations and conclusions based on the data.

III.1 The Setting

In general, the third year of the project was quite similar to the second year, with two major exceptions--only two libraries continued to participate*, and patrons paid full marginal costs for the search. (i.e. cost for searching & offline printing).

It is important to note that, as in the second year, there was little or no publicizing of the service. The libraries continued the policy of no publicity to control the search volume. Librarians from both libraries indicated that they felt their library could handle only approximately 40 searches per month. They stated that additional volume would place too heavy a demand on staff time, adversely affecting other reference operations.

Feedback from search patrons indicates that a majority of patrons from all three libraries learned of the search service primarily via word-of-mouth. (In Santa Clara County Library, a few patrons indicated they learned of the service from a notice posted in a public library, but most patrons learned of the service either from a friend or colleague, a public librarian, or a teacher.)

III.2 The Searches

Our discussion of the searches is divided into three parts--a discussion of the search patrons, a discussion of the mechanics of the search service, and a discussion of patron reactions to the search service.

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* The participants were the San Jose Public Library and the San Mateo County Library. Redwood City Public Library dropped out at the end of the second year, and the Santa Clara County Library in Cupertino withdrew early in the third year.

III.2.1 The Patrons

There appeared to be little difference between the clients at the two libraries. The two major client groups were graduate students and people involved in education. These two groups accounted for slightly more than 50 percent of the clients. The next two largest groups were technical and business professionals, followed by librarians and undergraduate college students. Together these six groups accounted for 78.5 percent of all clients. (see Table 3)*

San Jose showed greater use by educators, and technical professionals while San Mateo showed greater use by business professionals, librarians and undergraduate students.

These differences in clients seem to reflect differences in area demographics and library operations. San Jose is located closer to the "Silicon Gulch" high technology industrial area and, therefore, would logically attract more technical professionals. San Mateo is located in the general vicinity of the San Mateo Educational Resources Center, a search center which would logically handle most of the educational search demands in the county.

Some patronage could be directly traced to single individuals. For example a business professor at San Francisco State University required an online bibliographic search as part of a class assignment and most of the class went to the San Mateo County Library to have the search done (where the cost was lower than at other search organizations).

Interviews with librarians at both libraries indicate that they felt they could significantly increase interest by both business and technical professionals through marketing and promotion. (No marketing or promotion was done, however, because both libraries did not wish to increase demands on the service.)

More than half of the searches (58.8 percent) conducted during the third year of the project appeared to be directly related to the educational activities of the patron. The bulk of these searches (43.6 percent) were for the preparation of research papers. The remainder were attributed to school assignments and advanced degree work. (see Table 4)

Another 25.5 percent of the searches were job-related.

Nearly half (48.4 percent) of the search patrons reported that they used a public library at least several times per month. Almost 75 percent of the search patrons reported that they used a public library at least once a month. (see Table 5)

* All tables are shown in Appendix I.

On the average, the search patrons were quite well educated: 81.6 percent were college graduates, 64.7 percent reported they had done graduate work, and 26 percent held at least a masters degree. (see Table 20)

III.2.2 The Searches

Information on the actual searches is somewhat less detailed for the third year. During the first and second years, this information was obtained from two instruments--the search report form prepared by the library, and a computer generated command summary of the search. Due to a change in the output printing procedures during the third year, however, Lockheed did not supply us with the command summary reports and, as a result, the evaluation had to rely exclusively on the library search forms.

The volume of searches conducted during the third year was roughly the same as that during the second year, despite the increase in client cost. This was in marked contrast to the 50 percent drop in searches when the half-charge phase began.

A total of 326 searches was conducted during the third year -- 20 by the Santa Clara County Library (which withdrew shortly after the start of the third year), 62 by the San Mateo County Library, and 242 by the San Jose County Library. This averaged out to approximately 5 searches per month for San Mateo and 20 searches per month for San Jose -- both significantly below the "stress level" of 40 searches per month which librarians at both institutions felt was the maximum volume they could handle without additional staff time.

Offline preparation for most searches (89.5 percent) was 25 minutes or less. San Mateo reported that the bulk of their searches required five minutes or less preparation (41.9 percent) while San Jose found that the majority of their searches (51.3 percent) required 15-25 minutes of offline preparation. (see Table 1) This is an interesting difference. There appears to be a direct relationship between offline search preparation time and satisfaction with search results. (See Table 9)

The most frequently used databases during the third year of the project were:

Data Base ($ cost/hr.)	N (% of total) Searches
ERIC ($25/hr.)	146 (31.6)
Psychological Abstracts ($50/hr.)	95 (20.6)
NTIS ($35/hr.)	41 (8.9)
ABI (INFORM) ($65/hr.)	29 (6.3)
Eng. Index/Compendex ($65/hr.)	27 (5.8)
Dissertation Abstracts ($55/hr.)	22 (4.8)
Social Sience Citations ($70/hr.)	22 (4.8)

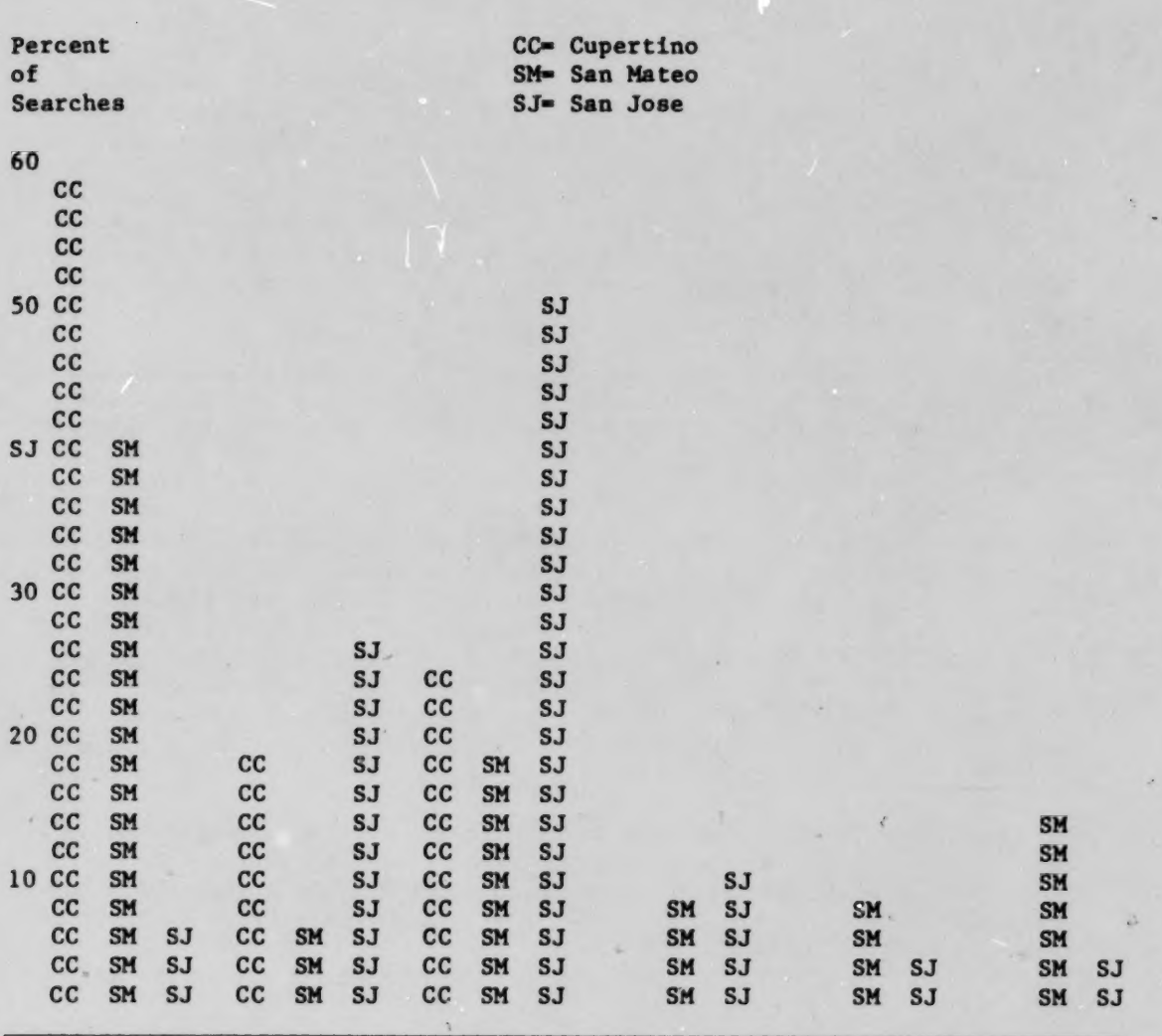

Figure 1: Comparison of offline search preparation time by library for year 3.

It is interesting to note that the three most heavily used databases (ERIC, Psych. Abstracts and NTIS) account for more than 63 percent of the total database use and that the seven databases listed above account for more than 84 percent of total database use. (see Table 11) Reasons for this are indicated in IV.5.

Most patrons received their search results within seven days or less of the query negotiation interview (89.5 percent). San Mateo appeared to be slightly slower in getting results to patrons (68.9 percent got results in seven days or less compared with 89.4 percent in San Jose). The difference could, however, be attributed to the nature of the San Mateo operation. (The San Mateo library is the reference center for the entire San Mateo county library system. It received requests from all county libraries and sent back printouts to these libraries for distribution to patrons.) (see Table 16)

Costs for the online searches were surprisingly moderate--even in the full pay mode. Only 4 percent of the searches cost more than $50, 84 percent cost $25 or less, and 38 percent cost less than $10. (see Table 12)

III.2.3 Patron Reactions

Most of the patrons (76.9 percent) indicated the search was of either major or considerable value. San Jose patrons appeared to value the search results slightly higher than did the San Mateo patrons. (see Table 8)

When asked if the search answered their question adequately, patrons of the two libraries were sharply divided. While 62.2 percent of the San Jose patrons indicated that they felt the search did adequately answer their question, only 31.3 percent of the San Mateo patrons felt the same. (see Table 9)

This lower level of satisfaction at San Mateo also was reflected in clients' responses to a question probing estimated future frequency of search service use. The majority of respondents indicated they would use the service several times a year, however,12.5 percent of the San Mateo patrons indicated they would not use the service at all in the future, while only 5.4 percent of the San Jose patrons responded similarly. (see Table 7)

As noted on the previous page, San Mateo reported spending significantly less time in offline search preparation than did San Jose. This may explain the differences in client feedback.

III.3 Library Reactions

Reactions of the library reference personnel during the third year were generally positive, but not enthusiastic. As noted earlier, two of the four participating libraries withdrew from the project. The Redwood City Public library withdrew at the conclusion of the second year citing adverse impact on staff time as a major reason. The Santa Clara County Library at Cupertino withdrew shortly after the third year began, citing roughly the same reasons. Both libraries that withdrew noted that they would continue to access to search services via cooperative arrangements with the San Jose City Library and the San Mateo County Reference Center.

The San Jose Library did experiment with providing service at a municipal library located in the San Jose Municipal Center. The experiment included placing a terminal in the library and announcing the availability of in-house searching,

In theory this should have been an ideal location. The municipal reference librarian spent a fair portion of his time conducting in-depth manual reference searches, thus the online searching would not be "something new" but would merely augment existing service. Unfortunately, the experiment met with little success.

A major factor in the lack of success was the fact that the municipal departments were unwilling to pay for the online searching. Manual searches were free -- all they required was staff librarian time (for which the departments did not have to pay).

A second reason, according to the municipal librarian, was that he found that his usual primary sources were not covered by the available online data bases.

The major impact in both the San Jose Library and the San Mateo County Reference Center was on staff time. Librarians at both institutions indicated that although they felt the service was valuable, it did "take time away" from other activities. Librarians in San Jose noted, for example, that they felt there was some resentment on the part of other reference staff members who had to substitute for them in public contact activities while they conducted scheduled searches.

Yet, both libraries indicated that they spent a significant amount of time conducting manual searches. Since time records were not kept for manual searches on a per-search basis, it was impossible to assess the average staff cost for manual searches. Data on manual search activity in public libraries indicate that most searchs are of short duration, however long searches are not infrequent.

Staff members at both libraries acknowledged that occasionally online searches were conducted (at no cost to the patron) rather than conduct manual searches. This was done when they felt the online search would save a significant amount of staff time.

III.4 Observations

This inconsistency reveals what we feel is the heart of the DIALIB experience. On one hand, the librarians acknowledge that online searching is a valuable tool. They appear to be quite able to learn searching and many become quite adept at it. They appear to enjoy searching, particularly the added sophistication it provides (both in service and in image). They also acknowledged that in many cases it is more efficient to conduct an online search than to conduct the same search manually.

On the other hand, the librarians still feel the search service is something extra -- and that it competes with other, more "legitimate" activities. Although not explicitly stated by these librarians, it appears to us that this attitude is at least partially a product of the fact that

patrons are charged for these services. All the librarians queried acknowledged that the library was unable to assume the total costs for searching, yet many of them appeared somewhat uncomfortable with the concept of charging in a public library.

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Stronger administrative support could have eased the staff time problem considerably. If, for example, the library administration had specifically allocated a set amount of staff time to the online search service (say 40 hours), then the reference librarians might not have felt that the search service was taking time from other activities. By failing to take such action, the administators left the search service to compete against other, well established reference functions for scarce staff time.

In general, however, the library reactions were positive, although not enthusiastic. At the conclusion of the third year both libraries opted to continue to offer online searching, although both acknowledged they planned to maintain it at a low profile.

The decision to continue the service is encouraging, however without additional investments of staff time and effort, we feel the service will continue to be used only by a very small percentage of the potential user population.

IV. A THREE YEAR COMPARISON

When the experiment is viewed across all three years, a number of trends appear.

The impact of staff attitudes and opinions was a major factor in determining the success of the service.

There was a significant increase in the amount of preparation time required when user charges were first introduced. The transition from half to full pay mode did not trigger an additional increase.

There were significant shifts in the kinds of people who used the service across the three years of the experiment.

Searchers tended to use only a narrow subset of the available databases to answer client questions.

Staff time continued to be the major problem encountered by the participating libraries throughout the study.

Search costs did not appear to be a problem to the patrons. Although there was a significant drop in the number of searches conducted when the initial charge period began (in year 2), the movement from half to full-pay mode (at the beginning of the third year) did not significantly impact the search volume.

IV.1 The Changing Project Environment

Before discussing the trends across all three years, however, it is important to describe the changing environment within which the project was conducted.

A number of changes in online searching occurred during the three years of the DIALIB project. The number and breadth of data bases increased substantially--when the project began, only 15 data bases were available on DIALOG and when it ended there were 57. Access to the search service had improved significantly, as had system reliability. The costs associated with online searching, including connect time, terminal rental and telecommunications access, all dropped. Training programs, and documentation, both for the online search systems and the data bases showed significant improvement.

Changes also occurred in the professional environment. There was an increased awareness of online searching. Two journals emerged in the area, and there were major conference programs on the topic. In addition, the funding problem received considerable attention through the discussions of fee-for-service conducted by the ALA [2,24] and other groups.

Within the public libraries, there was increased use of networking and increasing automation of routine library functions. There was increased staff awareness of online searching. There was also increased demand for developing new means for meeting the information needs of the public.

In short, the environment within which the DIALIB project took place was far from static.

IV.2 Importance of Individual Librarians

The major trend across the three years of the project is the impact of individual personalities upon the success of the search service in public libraries. During the course of the project we observed the impact of personalities at all participating libraries and at some non-CIN libraries as well. Although it is difficult to support with data we feel the personalities and commitment of individual librarians are the key factor to the success of online searching in the public library. In essence, what is needed is an enterpreneur -- somebody within the library staff who becomes a strong advocate of the service and is willing to promote it both within the library and to the user community.

Three specific roles determine the success of online searching in public libraries: the searcher, the head reference librarian and the library director.

The searcher is responsible for the actual interface between the client and the search service. Two basic types of skills are required -- query negotiation and online searching. Query negotiation is common to all reference work and online search skills are, to a certain extent, extensions of traditional library search skills. We have noted that some people are much more adept at online searching than are others, but in general it is a skill which can be learned. We feel the skills and personality required for the searcher can be found in most reference departments -- all that is required is training in the use of the online search service and in the use of specific data bases.

Although the qualities required for online searching are not particularly difficult to fill, the qualities required of the head reference librarian and the library director are rare and difficult to find. These roles require a strong personal commitment to the service and a sense of entrepreneurship. Without the strong support and commitment of both the head reference librarian and the library director, the potential for the success of online searching in the public library is at best marginal.

Figure 2 illustrates the impact of these two roles on the success of the search service.

The role of the library itself also has a significant influence on the success of online searching. The potential for success is increased when the service appeals to, and is used by, those portions of the user community the library feels a special obligation to serve. Public libraries have an obligation to serve the public--particularly their own communities. Increasing social concerns, coupled with federal funding focused on providing outreach programs to the disadvantaged, have encouraged libraries to reach out to special groups such as the elderly and minorities, and to low-income areas. Disparity between a library's "prime target groups" and the users attracted by the online search service may generate a sense of guilt. The guilt argument runs something like this--this is a special service that is consuming valuable staff time that could be used to provide services to our prime target groups, the people who really need us. This discrepancy between actual users and prime target groups does not appear to be limited to online searching [35].

Head Reference Librarian	Library Director: Low Support	Library Director: High Support
Low Support	minimal success potential	marginal success potential
High Support	marginal success potential	maximum success potential

Figure 2

Impact of support of library director and head reference librarian on success potential of online searching in the public library.

The discrepancy between intended and actual use appears to extend to services and specialty areas. We found, in interviewing librarians, that online searching had to compete for time against other, traditional services for staff time. Time to conduct online searches was perceived as being "taken" from other, more "legitimate" activities. It also appeared that librarians found it more "legitimate" to search data bases which were perceived as being related to the subject specialties and concerns of the library.

Figure 3 represents our observations in this area. Essentially, we feel that the success of the online search service in the public library will be directly related to the size of the cell representing the intersection of available data bases, library subject specialties, population demographics, and identified library service target population group.

IV.3 Preparation time

Offline search preparation time increased sharply between years one and two, but appeared to drop slightly in year three. During the first year 45.7 percent of all searches were done with no preparation and only 17.5 percent required more than 10 minutes of offline preparation. In the second year, offline preparation increased sharply, as librarians sought to minimize online time to reduce client charges. As a result, 62.7 percent of all searches required more than 10 minutes of offline preparation. During the third year offline preparation time of the same percentage of searches--62.7 percent--required more than ten minutes of offline preparation time. In the third year, however, 80 percent of the searches required less than 30 minutes of offline preparation time as compared to 61.9 percent for the second year.(see Table 15)

There appear to be several reasons for this drop --

1. The librarians were more proficient at query negotiation and search preparation.
2. The librarians were more familiar with databases.
3. There were fewer, better trained searchers.
4. Initial reservations to charging diminished.

We feel that all four factors were at work. We should note, however, that many librarians complained about the lack of adequate training -- particularly on new data bases. Initially two librarians from each library received training from Lockheed and were then responsible for training other staff members. Some additional staff members did subsequently receive training from Lockheed, however it was apparent that few librarians had received training on specific data bases. Also, it was apparent from the interviews, that the libraries could not afford complete reference aids for all available data bases.

IV.4 User Demographics

There appeared to be significant shifts in user demographics across the three years of the project.(see Table 18) Use by graduate students, education professionals and business professionals increased steadily across all three years. Conversely, use by technical professionals, scientists, and undergraduate students decreased steadily across all three years. Both trends appear to correlate with observed changes in database use.

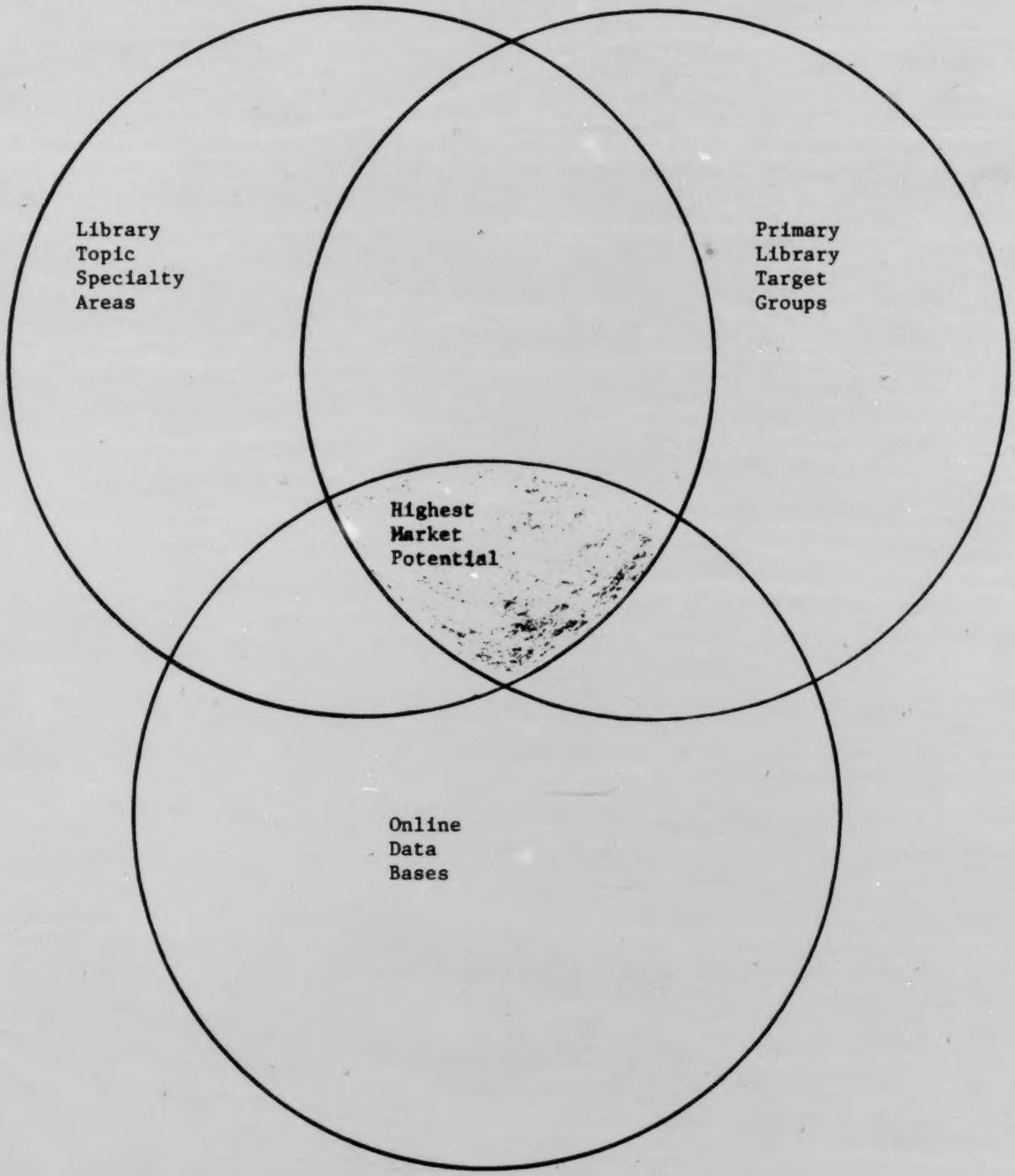

Figure 3

Factors affecting market potential for online searching in the public library

While we have no data to explain this shift, it could be in part due to the imposition of search fees. Certainly charging for the service would tend to make clients carefully consider the utility of the search and, perhaps, to seek alternate solutions to their information problems. The proximity of San Jose State University to the San Jose Public Library helps to explain the large number of graduate students. The drop in use by technical professionals and scientists might in part be explained by the withdrawal of the Redwood City and Cupertino libraries, which were the libraries closest to scientific and technological users. An alternate explanation is that continued use by a particular client group is directly related to the degree to which that group is well served by the library.

IV.5 Database Use

During the course of the interviews, most librarians noted that they had little demand for most of the available data bases. Their comments indicate that for the most part, data base use accurately reflects the interests of the clients.

Looking across all three years of the project, there was a significant movement towards the use of only a few databases. The use of both ERIC and Psychological Abstracts increased steadily across all three years of the project.

	Year 1		Year 2		Year 3	
	#	%	#	%	#	%
ERIC	344	(15.5)	232	(24.7)	146	(31.6)
Psych. Abs	357	(16.0)	180	(19.2)	95	(20.6)
TOTAL		31.5		43.9		52.2

In the third year of the project, these two data bases were used for more than 50 percent of the searching.

Databases which showed decreasing use included NTIS, Social Science Citations, Engineering Index, INSPEC and Chemical Abstracts.

Interviews with the librarians revealed that they were aware that they were using only a few of the available databases. All librarians indicated that they felt most comfortable with the frequently used data bases and they acknowledged that significantly more preparation time was needed to search the infrequently used data bases.

There are several possible causes for this increasing reliance on only a few databases:

1. These are the databases the librarians felt most comfortable with and therefore tended to use to answer most questions.

2. The search topics dealt with areas that were covered only by these databases.

3. The search topics reflect the fact that the service attracted only a particular type of client whose search requests dealt with the areas covered by these databases.

Although it is impossible to identify the exact cause, it is interesting to note that while this usage pattern appears to parallel that displayed in the METRO-Teachers College search project*, it is quite different from the the heavy commercial and technical data base use reported by INFORM [27] and INFO 2 [5].

IV.6 Search Costs

Search costs to the patron are difficult to compare. No costs were charged to the patron during the first year. During the second year, patrons paid only 50% of the search and print costs and had the option of obtaining a "standard search" for only five dollars. (The standard search was of one database with a maximum of 20 citations.)

It is interesting to note, however, that it appears that the actual search costs dropped slightly during the third year. This observation is based on comparing actual third year search costs against estimates for these costs based on the second year data. Below are listed the various search cost levels, percent of searches performed at each level during year 2, projected third year search distributions and actual third year distributions.

cost level	actual year 2 (%)	projected** year 3 (%)	actual year 3 (%)
0-4.99	25.9	13	10.1
5-9.99	35.4	13	25.2
10-14.99	10.5	17.7	21.5
15-19.99	8.2	17.7	12.9

* ACR is also evaluating online searching offered through the New York Public Libraries via a cooperative agreement between the New York Metropolitan Reference and Research Agency (METRO) and Teachers College at Columbia University. A final report of this project will be available in late 1977.

**Projected costs were obtained by assuming that the distribution of actual search costs would remain the same (although in the third year patrons would be charged the full cost of the searches.) Thus, given that 25.9% of all searches in the second year cost 0-$4.99, the actual cost of these searches ranged from 0-$10. We assumed an even distribution so 13% of the searches should cost $0-$4.99 and 13% should cost $5-$9.99. The precision of the cost reporting prevented projections beyond the $19.99 level.

It is also interesting to note that the imposition of full search charges did not result in any decrease in the number of searches performed. Both libraries showed an increase in search volume over the previous year. San Jose displayed a fairly stable search volume across all three years while San Mateo experienced a significant drop in search volume with the imposition of search charges.

	# of Searches	
Year	San Jose	San Mateo
1	252	198
2	226	44
3	242	62

IV.7 Increased Patron Presence, Decreased Time Impact

Cooper and DeWath (see Appendix II) noted that the patron was present for the search much more frequently (50 percent of the time) during the pay period (Year 2) than during the first year free period (15 percent). They suggested that this was perhaps due to the increasing confidence of the librarians. Another reason, of course, is that the patron can assist the searcher in conducting the search--particularly in highly technical areas.

Data suggest that the time impact of the patron's presence on the search was significantly less during the pay period. During the free period, searches conducted with the patron present required almost 50 percent more connect time than did those conducted without the patron present. During the second year pay period, the increase in connect time due to having the patron present at the search was generally insignificant. This suggests that having the patron present at the search is no hinderance for the experienced searcher.

IV.8 Increased Inter-Library Conformity

As the libraries became more experienced in online searching, their time performance appeared to stabilize. Cooper and DeWath noted significantly fewer differences between the libraries in Year 2 than in Year 1. Some differences in library style remained, however, the search processes appeared to become more uniform. (see Appendix II)

The move from half-pay to full-pay generated very little change in library operations. Search volume remained roughly the same, as did search activities. The withdrawal of two libraries from the project left the sample too small to make any robust comparisons between libraries.

V CONCLUSIONS

This section provides a brief discussion of our overall impressions of online searching in the public library. They are based on the DIALIB project, on data we have obtained describing similar services [5,27], and on a review of the relevant literature.

The public library of the future will undoubtedly offer computer-based services of various types to a greatly expanded clientele. However, how feasible is it for the public library to do so today, and what are the major practical and philosophical questions it raises? The DIALIB experiment has been only a limited success--at least from the point of developing a viable search service in the four participating libraries. The problems and issues it raised may, however, be excellent guidelines for future public library planning.

V.1. The Market

Online searching has been expanding rapidly from a highly specialized service available only to, or through, government agencies, to a service that is available to hundreds of academic libraries and industrial users. Heretofore, however, it has not been available to the general public. Until the advent of DIALIB, only people associated with large organizations had access to the scientific, technical and business-oriented data bases available through Lockheed, and other vendors.

The DIALIB experiment has shown that there is a market for existing data bases. It is made up of employees of small businesses, of students from colleges and universities who do not otherwise have convenient access to online searching, of individuals who are starting up a business, doing personal research or investigation, and of local government officials. Other users of the service came from government agencies of all sizes and descriptions, and small high-technology firms. These people appear to have a need for access to online searching and may have no other point of access. They have been vocal in their endorsement of the public library as a linking agent to the data bases, and have been willing to pay for the use of the service.

Unfortunately, it is not possible to estimate what usage of the service would be if the libraries were able or willing to engage in a modest amount of advertising. The service was publicized vigorously when the DIALIB experiment began, using demonstrations, posters, brochures, newspaper stories,etc. Since the searches were free during the first year, demand soon began to tax the staff resources of the participating libraries. The publicity led to a demand that appeared to be greater than they could handle. Additional promotional efforts were halted. Although the demand during the second and third years of the experiment was less than the libraries felt they could support, they were unwilling to authorize further publicity. As a result, most users of the service during the second and third years heard about it through word-of-mouth.

V.2. Library Impact

V.2.1 What Skills and Training Are Required?

Many librarians involved in DIALIB became skilled online searchers although most would agree with one of the conclusions from the Interim Report that to maintain search proficiency, "online searchers must complete some 'critical mass' of searches each month in each data base for which proficiency is desired; the large number of different data bases makes it difficult for an individual to maintain a thorough knowledge of each data base." [1]

Several DIALIB patrons who responded to a follow-up questionnaire complained that the librarians were not sufficiently expert to do a good job--perhaps as a result of the large number of data bases and low volume of search requests. When fees were charged, users became increasingly demanding of expert professional service and critical when they felt they weren't getting it.

There appear to be two problems here--training on specific data bases and subject skills. Many DIALIB searchers complained about the lack of training on specific data bases and emphasized the need for such training. Each data base is unique--it has its own organization, thesaurus, and idiosyncracies. While it is possible to search the data base with little or no training, the quality of a search is to a large extent determined by the training and experience of the searcher in the data base being searched.

The second problem area has to do with subject expertise. For research queries of greater complexity than "simple fact" questions, many people feel that the searcher should be a subject expert. It is felt that a librarian searching Chemical Abstracts, for example, cannot do a good job without a knowledge of chemistry. This problem can be at least partially resolved by having the patron present for the search to assist the searcher. (This assumes, of course, that the patron has some knowledge of the search topic area.)

Is this an insurmountable problem with using public librarians as searchers of scientific and technical data bases? The public librarian is almost always a generalist (or a specialist in a broad area). It remains an open question whether a generalist can effectively provide services to highly specialized groups. Perhaps the public librarians could more effectively serve other groups, leaving the provision of scientific and technical information service for experts in these areas. Organizations and groups that <u>specialize</u> in the provision of expert computer searching can assign one searcher to three or four data bases; it may well be that for the most effective searching, such specialization is required.

V.2.2 Is there a connection between skills developed for manual searching and skills useful in computer database searching?

The traditionally trained (i.e., as a generalist) public librarian does have a variety of skills that are directly applicable to the kinds of skills required in online searching. These include the ability to form

an adequate search query by consulting with the user and encouraging the user to commmunicate his needs fully. The traditionally-trained reference librarian is already expert with complex manual tools--thesauri, indices, etc.--and the skills developed with these tools are transferable to computer database searching.

There is considerable evidence that traditional reference librarians are willing and able to learn data base search techniques. The Northeast Academic Science Information Center (NASIC), an organization that functioned as an organizational intermediary between the data base producers and a group of academic libraries, became deeply involved in the training of reference librarians to use online searching. On the minus side, they found that "not all librarians are well suited to adapt to the new role of "information services librarian" (as they termed the librarian trained to do online searching). Problems included fear of the terminal, a reluctance to type at the keyboard in the user's presence, and "an unwillingness or inability to undertake the intellectual effort associated with conceptualizing a search problem and creating an appropriate search strategy." On the plus side, however, they had an overall 80% success rate which they maintain "represents significant documentation of the capability of the traditional reference librarian to fill this new role." [29]

V.2.3 Are library schools preparing librarians to deal with the new information tools and technologies?

Although library schools are expanding their programs to incorporate modern technology and principles of information science into their programs, change comes slowly. As Williams (32) has noted:

> "Schools of information science and schools of library science have not kept up with the rapid developments in the last ten years and their curricula have not had nearly enough emphasis on the design and use of data bases and on associated software, systems, and search services. These schools definately need to change their emphasis and introduce new courses if they are going to produce people capable of designing and providing modern reference services."

Library schools must develop programs which will train librarians to deal not only with the the libraries and information services of the present, but also of the future. This requires concentration on conceptual and analytic skills to cope with the full range of information processes and activities rather than training to perform specific tasks or deal with specific technology. Given the rapid advances in information and communication technology in the last two decades, even current, state-of-the-art library systems may soon be obsolete. In short, library schools must learn to focus on processes rather than on tasks and specific technology.

V.2.4 Is the role of in-depth reference searcher a new one for the public librarian?

How much time actually is spent by a public librarian in lengthy, in-depth, personalized searches for a client? The answer seems to be that the majority of public librarians (including reference librarians) spend very little time conducting such searches. The same seems to be true of most academic librarians.

David Wax, director of NASIC, says that, "in the academic environment, with the single major exception of the biomedical library, the reference librarian has not traditionally performed personalized search services for either faculty or students because of the lack of staff time and resources for such services. As a result, the role of the online searcher is a totally new one for the academic reference librarian."

Wax contrasts the new role for the academic librarian with the role of the special librarian. "In most governmental and commercial libraries, the librarian as an online searcher represents only an extension of the traditional role of the special librarian. The conducting of personalized bibliographic searches has long been an activity of the special librarian; the online search is merely a new and less costly means of providing this service." [29]

The online search could, perhaps, be viewed as a custom information package or personalized library service. As such it could be considered a new type of service, not simply a faster, cheaper way of carrying out an old service. This perspective could provide support for charging for the service, especially when there is reason to believe that the library would be hard-pressed to offer the service at all without some means of recouping its costs from the users.

In general, there appear to be few precise reference/information policies in public libraries which establish limits in terms of services offered, topics covered, patron eligibility, and allocation of staff time. Public libraries have been able to live with informal limits because the demands placed upon reference service have not been that great. One major result of the DIALIB experiment has been to focus attention on the reference function in the public library. Given the rapid advances in information technology, it would seem considerable thought should be invested in determining what the reference function of the public library should be in the future.

"It would seem," writes one commentator "that we have not honestly or realistically decided upon a philosophy concerning the nature and scope of these services. How much service do we provide for whom, when, where, and at what level?" [13]

V.2.5 What "human factor" elements exist, and how will they inhibit or help the development of online searching in the public library?

The future of online searching in the public library will probably rest in large part on the attitudes of the people providing the service. The analysis of Year II of the DIALIB experiment, for example, concluded that "the attitude of the head reference librarian toward online retrieval affects the speed and efficiency with which searches are completed." Speed and efficiency of the service will have an impact, in the long run, on the ability of the service to attract and keep a clientele.

The reasons underlying negative attitudes towards such a service are manifold. One may be a resentment (and fear) of automation:

"Some librarians have become particularly sensitive on the subject of the mechanization of information and library processes. They believe, and rightly so, that they have been retrieving information for years, and that it is basically a human process. In library terms, they call it reference work, and most librarians are very skillful information hunters. Their pride is therefore legitimately disturbed by suggestions made by some naive persons that a mechanical cure-all just over the horizon will place the Library of Congress in a small black box, increase efficiency a thousandfold, and do all this at less cost." [11]

Other reasons include strong convictions about fee-for-service, concerns about budget constraints, concerns about primary target groups for library services, staffing constraints, etc.

V.2.6 What changes can be expected in the library as a result of the service, in terms of work load, demands on the collection, image in the community, allocation of staff time, etc.?

The introduction of online searching into the public library setting gives the library a chance to change its image by expanding and deepening its services. The computer allows the public library to offer personalized data base search services, for both individuals and organizations. Such services can expand the library's clientele, and make it a more useful information resource to these segments of the population. However, the first two years of the DIALIB experiment had little noticeable impact on library image in the librarian's judgement. [1]

Offering a new service requires that the library be prepared to undertake an active role in user education and promotion to introduce their clientele to the service and to attract new clientele.

According to Martha Williams [31], once the service is in use, the library must be prepared for a change in acquisitions policy. Online searching may identify a need to subscribe to new journals. Database searching can affect the interlibrary loan traffic of the library "as either a borrowing organization or as a lending organization, depending on the correspondence between the library's serials and monograph collections and the retrieved citations from database searches". David Wax of NASIC suggests that the library must face the possibility that there will be an increased use of its serials collection and a clear increase in interlibrary loan activity. (However, the DIALIB libraries <u>did not</u> experience this effect.)

The most noticeable impact of the second year evaluation of DIALIB was in the allocation of reference staff time. This time allocation was identified as "one of the most important factors to be considered in planning an online search service". [1]

V.3 Financial Considerations

Online searching costs money -- both in terms of staff time and in terms of actual outlay of funds. For a detailed discussion of the costs of an online search service in the public library, see the Cooper and DeWath analysis in Appendix II and in the second year DIALIB report [7,8] The financial requirements for online searching can be divided into three types.

Capital (startup) costs include initial training, initial purchase of a computer terminal (if the terminal is purchased), purchase of documentation, and initial training costs.

Marginal (or variable) costs are those costs that can be associated with a specific search. They include retrieval service costs (based on terminal connect time and printing charges), communication costs, and search-related staff time.

Overhead charges are those charges that are specific to the online search service but cannot be associated with any specific search. These may include terminal rental (if the terminal is rented), terminal maintenance, staff time, initial training (and also search-related staff time if not charged as a marginal cost), maintenance of documentation and maintenance of training.

V.3.1 Is Free Service Feasible?

Is it possible for the library to completely subsidize an online search service, without having to cut back severely on all its other programs? Although libraries might like to be able to offer unlimited completely subsidized searches, budget problems preclude them from doing so.

Libraries have several options for dealing with these charges. They can absorb all costs into the library budget and offer free searches to all, or they can elect to charge and recover a portion or all of the costs. We have observed two approaches to the cost recovery solution.

The San Jose and San Mateo libraries chose to recover marginal costs via patron fees. All capital and overhead costs were assumed by the libraries (including all staff time). This solution did produce staff impact problems that are described elsewhere in this report.

Other libraries who have introduced online searching have opted for different solutions. INFORM (Minneapolis Public Library) [27] and INFO 2 (Tulsa Public Library) [5] chose to recover all marginal costs, including staff time, through patron charges. They both charge an hourly fee of $25 in addition to search and print charges. This fee appears to cover actual staff costs plus at least a portion of their overhead costs. Although we know of no public libraries that provide free online searching, some academic libraries, such as West Valley College in Los Gatos, Ca. have experimented with this approach.

The fee question, with regards to online searching, is summarized briefly on the following page.

1. If the service is going to be free, then it must be free to all. This means that it must be advertised to all segments of the library population. This means, of course, that demand for the service will probably show a rapid growth rate (see the growth figures, Ahlgren [1]) and will have significant impact on staff time. Eventually it will require the establishment of some sort of priority or the service may consume an excessive share of the library budget. How can these priorities be set?

2. If the service is to be fee-based, then

   a) what cost elements should be recovered by fee and what cost elements should be absorbed into the library budget; and
   b) should a surcharge be assessed to support other services and search services for those who cannot afford fees?

If the fee does not include recovery for staff costs, then the search service must compete with other services for staff time. Given a fixed amount of staff time, either search volume must be controlled or other services will suffer. If volume is controlled however, that control may impact potential user groups unequally and generate de facto discrimination.

Unfortunately, the fiscal management practices in the libraries we have observed do not appear to provide the kind of data which can be used to help determine charge policies for online searching.

In general, libraries tend to account for or allocate staff time on a very general basis. If staff costs were treated as marginal costs and assigned to specific activities it would provide a much clearer picture of how staff time is utilized. More specifically, none of the libraries we studied recorded reference staff activities in sufficient detail to allow accurate costing of reference activities. If such records were available, they would be extremely valuable in assessing the cost of online searching.

Libraries already do receive some income -- from book fines, copy services, rental typewriters, etc. Often, these funds are applied against the general library budget, rather than accruing to specific programs. Thus, although the libraries do charge for some services, the funds do not accrue to these services. If fees are to be charged for specific library services, then it seems reasonable that these fees should be specifically allocated against the costs of the fee-producing services.

We are not advocating movement towards an all-fee library. Rather, we suggest that if any fees are to be charged in the library, they should accrue to the library to support other services and to provide incentive for efficient management. If, for example, fees were set to provide for full cost recovery plus some reasonable surcharge, the surcharge could be used to support other services and to provide "grants" to those who desired access to the fee services but lack funds to pay for them. Our studies of online searching indicate that patrons are willing to pay for the service. In fact, patron feedback regarding fees suggests a price elasticity that could certainly absorb a modest surcharge. The success of INFORM [27] and INFO 2 [5] support this observation.

For the present, the cost of online searching makes the cost of unlimited free service economically infeasible. Costs are dropping, but for the next few years we feel they will remain too high to allow public support of unlimited free searching. It is possible that some limited free searching program could be developed, based on either public funds or a surcharge on fee searches.

One approach to free searching might be to offer a very tightly defined program. Such a program would require a specified budget and well-defined limits regarding data bases to be searched, funds to be expended per search, access, type of requests that would be answered, number of searches allowed per individual, etc. In short, the library would have to accept that there were finite limits to the search program budget and develop rules to provide for the equitable distribution of those funds.

In a cost study conducted for this project Cooper and DeWath (See Appendix II) found that the average actual cost of searches conducted during the second year of the DIALIB project was approximately $26 including staff time, connect time, and the cost of offline printing, but not including the cost of terminal rental. A budget of $500 per month would provide for a terminal and approximately fifteen free searches per month. A budget of $1,000 per month should be ample to support a search volume of approximately 30 searches per month. This is roughly the monthly search volume experienced by the DIALIB libraries during the second and third years of the project. It would be imperative, however, that some sort of limits be established for the service.

Specification of service limits is not unusual in public libraries. Just as libraries now charge for some services, they also have limits on some services. Some libraries have residence requirements for checking out books; some limit the number of books a patron can check out at any one time.

Thus both the free and fee appoaches have a number of aspects which must be carefully considered by a library planning to offer online searching. Ultimately, the decision is up to the library.

V.3.2. Would fee service be acceptable to the library?

Many librarians strongly oppose charging for any library service and it appears that a great many librarians would rather not offer a service at all than offer it for a fee [10,14]. The California Library Association (CLA) recently passed a resolution in which they stated that "public libraries should provide free access to online database services just as they do other library materials (like an expensive reference book) regardless of price". [2] In the mid-winter meeting of the American Library Association a similar motion failed [21] however in its 1977 annual meeting in Detroit the ALA did pass a resolution to the effect that charging for library services is discriminatory in publicly supported institutions. [9] However, as the Library Journal notes:

"The fee debate will be with us now, for years to come. We've only begun, and by the time we're finished, we'll have had opinions from the information industry, from government, and from citizens and taxpayers about how we should support library service." [24]

V.3.3 How can manual and computer-assisted reference searches be compared in terms of cost?

There has been much discussion about the connection between manual and computer reference work in the public library. Such questions as "Why charge for one if you don't charge for the other?" bring us right back to the fee controversy.

A recent comparison of manual versus computer reference searches on sophisticated reference questions in an industrial library indicates that the "average" manual search costs $250. The same search conducted online costs only $47. [12] Most public library reference questions, at least in the DIALIB libraries, tend to be of the quick-answer variety and require only a few minutes of searching.

To the best of our knowledge, there are no studies that compare manual and online searching in public libraries. The DIALIB libraries did not document reference activities in sufficient detail to make such comparisons.

The introduction of online searching provided the librarians with a new tool which allowed them to greatly expand the scope and depth of their reference searches. It also provided them with increased confidence to deal with technical reference questions. The service also, undoubtedly, generated an increased demand for sophisticated reference services in the libraries. This occasionally backfired. For example, one patron submitted a sophisticated search to be conducted online, but upon learning that a fee would be assessed, requested that the same search be conducted manually (free of charge). The library had already accepted the request and was obliged to conduct the search manually--even though it could have been done more rapidly and efficiently online. We wonder if the library would have accepted the search had the the online search capacity not been available.

V.4 Operational Considerations

There are several models that the public library might explore for offering online searching. Four are discussed briefly in the following sections.

V.4.1 The "in-house" model

One model is to develop an in-house search capacity as did the DIALIB participants. This will require a terminal (purchased or leased) and communication lines, a contract with an online retrieval service, and at least one trained librarian who performs searches as part of his/her regular duties. The Redwood City, Cupertino and San Jose City Libraries are all examples of this model, and it is discussed extensively throughout this report.

V.4.2 The network model

The network model builds on an existing library network or serves as the nucleus for one. One library provides search services for all network members. All librarians receive a basic orientation program and conduct query negotiations at their respective libraries. Queries are sent to the search library, the search is conducted, and the results are sent either to the originating library or directly to the patron. The San Mateo County Library is an example of the network model.

This model provides economy of scale which should both reduce costs and improve efficiency by providing a critical mass of searches. It has the disadvantage of increasing the distance between the client and the searcher, however our comparison of in-house vs. branch interface with clients found no difference in the value of the searches provided by the in-house and network models. One potential problem, however, is the reluctance of network members to forward requests for assistance, as indicated in Section VI.8, and Appendix IV.

V.4.3 The library-broker model

Private information brokers could contract with libraries to supply online search support. The library would handle the query negotiation and submit the query to the broker. The broker would conduct the search and the client would obtain the completed search from the broker, who would bill the client for the search.

V.4.4 The referral model

A variation of the library-broker model would be for the library to provide referrals to organizations providing online search services. These might include other libraries, brokers, or other organizations.

The library broker and referral models may be useful to avoid the problem of possible competition between the library offering search services itself and the new information organizations--commercial information vendors and brokers--that are developing. These "for-profit" entities with their explicit business orientation and narrow focus (their freedom from the broad expectations which weigh upon the public library) may be able to operate more effectively and efficiently than the public library can.

V.5 The Future

Earlier, we discussed the fact that with current data bases, the library may not be able to generate enough business to justify providing online searches to clients who may only be a small segment of the total user population. However, why should libraries limit themselves to currently existing data bases in planning for the future? The potential of computer data bases, to provide access to information of all kinds, is very great.

Today, the public library may be able to expand its usual clientele by providing online access to scientific, engineering and business files that do not primarily constitute a significant part of their collection. The precedent of computer services available in the public library may eventually lead to data bases of interest to the "common man"--job information, referral services, listing of apartments and houses for rent and for sale--in fact, an all-around community information service.

Libraries, in planning for the future, should not only ask themselves who their users are today, but who their users might be in the future. Their future users might be scientists or engineers, or the massive group of people who simply aren't interested in using the public library today, because they have never found it useful for their particular needs. Small public libraries in remote locations might especially benefit from the use of computer and communication technology to provide services to "ordinary" people. The small library could, with the help of these technologies, be transformed into a resource of great utility and versatility. This is the focus of the NCLIS plan.

Another possible future development is the "information grant" which would be used to pay for library fee services. Under an information grant program those who desire access to fee-based information services but are unable to pay for them could apply for a grant to cover the cost of those services. These grants could be made either out of general funds (similar to the way many other social services are funded) or they could be financed by a surcharge on the information service fees charged by the libraries.

The development of an information grant program may go a long way towards meeting the complaints of opponents of fee-for-service activities in the public library. It would require a great deal of work, and considerable creativity and imagination on the part of librarians, however we feel the potential justifies investigation.

VI. PROBLEM AREAS

Although the DIALIB study indicates that the public library can serve as a linker between online search services and the general public, it also identified a number of problems which must be solved if the service is to be a success. We have identified ten major problem areas which are described in the following section.

VI.1 Establishing Scope and Limits of Service

The first problem area a library will confront in offering online searching is how to define the scope and limits of service. Every library has some set of rules to define scope and service. Some rules are explicit--such as requiring cards to check out books, the requirements for library cards, etc. Other rules are implicit, rather than explicit--for example rules governing reference services. In addition, the library can also limit service without rules--by not advertising the service.

In offering online searching the library must invest significant effort into establishing the scope and limits of the service. Issues which must be dealt with include:

What are the goals and objectives of the service?

Will the service be used to support internal operations, to provide service to patrons, or both?

What limits should be established in terms of subject areas, costs, staff time, etc ?

Who will be allowed access to the service?

When will the service be available?

What kind of service will be provided?

These are major questions. Determing the scope and limits of the service has major impact on other decisions which must be made. It is important that the service should be structured by the goals and objectives of the library and the needs of its patrons, not by the potential of online searching.

VI.2 Staff Time Requirements

Staff time requirements associated with the introduction and provision of online searching cannot be over-emphasized. Throughout the DIALIB experiment staff time was the major inhibiting factor. Searches average approximately one hour (for query negotiation, search preparation, searching, and post-search activities). In addition, time is required for promotion, accounting, and training of search personnel.

Libraries planning to introduce online searching must very carefully consider the impact on their staff. They must be prepared to add staff to support the new service or to divert staff from other activities, if and when user demand develops.

VI.3 Staff Attitudes and Support

Preconceptions and attitudes of library personnel toward fee-based service, and role of reference services play a great part in determining the direction and ultimate success of online searching.

More specifically, the attitudes and support of the head reference librarian and the library director are crucial to the success of online searching. Unless both are firmly committed to work for and support online searching, the probability for success is at best marginal.

The attitudes and support of the reference librarians who will serve as searchers are also important. However their reactions towards online searching in the public library will be determined, to a large extent by the activities and opinions of the head reference librarian and the library director.

In developing a plan for online searching, it is vital that emphasis be placed on establishing and maintaining the support of the library staff--from the administration to the reference service to the circulation department.

VI.4 Supporting the Service Financially

Libraries have two basic options for supporting online searching--it can either be supported from the library budget and offered to the patron at no cost, or it can be offered at a fee. Both approaches are discussed in some detail in Section V.3.

If the service is supported by the library budget, then the library must develop policies which define and limit the services provided. In the free portion of the DIALIB project the libraries did not place overt limits on the service. When they were confronted by rapidly increasing search requests, they opted for an implicit form of control--cutting off all publicity about the service. The lack of specific policies and rules for the online search service had a continued impact on the DIALIB project. This is an area which should be of prime concern regardless of whether the service is offered on a free or pay basis.

If the library chooses the fee-for-service approach to online searching, we suggest that the library seriously consider the cost recovery approach, indicated in Section V.3.I, that at a minimum recovers full marginal costs of the service, including staff time. Our data indicate that patrons who are willing to pay for the service probably will be willing to pay for staff as well as search costs. Failure to recover staff costs will result in an additional staff burden on the library. Unless the library is able to provide additional staff time to meet this burden, (and increase the additional staff time as search volume increases) the search service will be forced to compete with other services to its detriment.

VI.5 Need for Promotion & Education

Promotion and education is an essential part of the development of the online search service. Failure to promote the service will ensure that it is used by only a portion of the potential user population -- essentially the sophisticated information user. Given that the service will be at least partially supported by public funds, it is incumbent upon the library to ensure that all potential users be made aware of the availability and potential of the service. Failure to do so may constitute *de facto* discrimination against the less sophisticated information user.

In many cases this will require not only promotion, but also education. Promotion is concerned with making people aware of the service. Education is concerned with teaching them the capabilities and limits of the service. Regardless of whether is is free or not, the search service should be used only when there is a reasonable expectation of success. To do otherwise would generate a significant strain on staff time and would be a disservice to the patron.

VI.6 Need for Searcher Training

In addition to documentation, the library must also invest in searcher training on data bases. The search services generally offer one and two day training sessions in the use of their systems, however training in the use of specific data bases is generally offered by the data base producers.

Lack of specific data base training was a common complaint among librarians in all libraries during all three years of the project. In obtaining specific data base training the library will confront three problems:

availability of training -- data base providers generally offer training sessions only a few times a year in various parts of the country;
availability of personnel -- sending librarians to training presents a staff cost expense to the library; and
training costs -- many data base providers charge for training sessions and, unless the sessions are available locally, training may require travel and per diem costs.

VI.7 Need for Documentation

To provide effective searching, the library must be prepared to invest in and maintain adequate support documentation. Documentation is required both for the search services, and for each individual data base. Some of this documentation is available free of charge, however some must be purchased. Costs for this documentation range from a low of $10-$15 to a high of well over $100 per data base.

There is a need for better documentation that describes and compares a number of data bases and search services. Some work has been done in this area (for example by the National Federation of Abstracting and Indexing Services and by Martha Williams and the American Society for Information Science).

VI.8 Need for a Critical Mass of Searches

A critical mass of searches is required to maintain searcher competence. Most librarians interviewed agreed that 5-10 searches per month were necessary to maintain search skills for each data base. Certainly it is possible to conduct searches on a less frequent basis, however the librarians indicated that they felt under these circumstances they were less efficient.

The search competence is concerned with specific data bases rather than general skills required to deal with the search system.

This suggests that rather than have one or two searchers handling all searches it would be more effective to train a number of searchers and have each specialize in only a few databases.

Centralized searching for a library network is feasible--data show little difference in client satisfaction with results when the search is negotiated at a branch rather than the searching library. The data also show, however, that branch libraries in San Mateo County sent in few searches. Thus although maintenance of a centralized search facility may provide the necessary critical mass, careful attention must be paid to training and working with branch librarians. Training should include familiarity with the online search service, an awareness of available data bases, and query negotiation.

VI.9 Management and Evaluation

Another area which libraries should explore carefully is management and evaluation. We have noted elsewhere the need for improved management practices--particularly in accounting for staff time. It is essential that accurate data be collected to allow the library administrator to assess the impact of the search service--both on the public, and on the library. This requires the establishment and maintenance of detailed procedures for recording staff time and activities.

If the service is to be offered on a fee basis, then additional procedures are required to govern the collection of funds.

If the service is offered via a network, then it is important that a single, uniform system be developed to transmit requests to the searching library and to transmit search results back to the requesting library.

Evaluation is extremely important. This includes evaluation of the search service and evaluation of the impact of the service on the library and on the community. It is essential that some procedure be developed to collect user feedback to assist in the evaluation.

VI.10 Competition

One last problem which warrants some discussion is the potential for competition. The past few years have seen the development of the information broker business [28]. Information brokers are private organizations who provide linkage services between clients and sophisticated information services. There were no brokers operating in the specific area of the DIALIB project, and we are not aware of any conflicts between private brokers and public libraries, however the growth of this field is such that it seems certain that such a situation will eventually occur, since it has begun to emerge in other areas [32]. The potential conflict generates a number of interesting questions. For example:

1. Should public libraries compete with brokers in offering fee-for-service online searching to the public? If so, under what circumstances?
2. Could the library work out some sort of cooperative arrangement with the broker where the library either purchases searches from the broker or refers search clients to the broker?
3. Given that the broker will demand a fee for searching, how will libraries deal with those people who wish to have access to the power of online searching but cannot pay for it?

We do not have the answers to any of these questions. We pose them as a warning of conflict to come and as a suggestion for much needed policy research.

VII RECOMMENDATIONS FOR FUTURE RESEARCH

Although the DIALIB study generated a vast amount of data describing the impact of online searching on the public library, it also identified a number of areas which require future research. Three of these are described briefly below.

VII.1. Need for Time and Motion Data on Reference Activities

We found little hard data to describe the staff cost of everyday reference activities. Some studies have been conducted, but additional experiments and studies are needed to develop more accurate descriptions of the reference function. For example, we found the libraries did not keep accurate records on the number of reference requests handled. Some kept counts, but none recorded the staff time required to deal specifically with reference questions. Data are also needed on the complexity of reference questions handled by public libraries. It would be interesting, for example, to conduct time-and-motion studies on manual reference services similar to those conducted by Cooper and DeWath as part of the DIALIB studies.

We need studies to develop and apply methodologies for collecting and interpreting such data [17]. We also need a commitment on the part of library management to develop programs for the continued collection of such data as an ongoing management activity.

VII.2 Need for Experiments with Funding Approaches

The DIALIB project offered no interlibrary variation in funding algorithms. We do have some data from other services such as INFORM, METRO and INFO 2, however we feel additional experiments dealing specifically with the financial support of online searching in the public library should be conducted.

The management and administration of library resources offers a very fertile area for exploration. As noted in the previous section, most libraries fees are applied against the general library budget. What would happen if these funds accrued to the programs which generated them?

Staff time is also a resource and is, we feel, an extremely interesting area for experimentation.

VII.3 Conceptual Refocusing of the Role of the Library

Another area which deserves additional study is the role of the library in an increasingly information dominated society. The National Commission on Library and Information Science continues to consider this problem. The White House Conference on Library and Information Services, pianned for 1979, also will deal with this issue. We encourge continued activity in this area--not only at the national, but also at the state and local levels.

SOURCES

[1] Ahlgren, Alice. Two Year Interim Report. Investigation of the Public Library as a Linking Agent to Major Scientific, Educational, Social and Environmental Data Bases. Annex I: Evaluation Results. Applied Communication Research, October 1976.

[2] "ALA refuses to condemn user fees." LJ/SLJ Hotline, February 14, 1977, Volume VI, No. 7.

[3] Anderla, Georges. Information in 1985. Organization for Economic Cooperation and Development, 1973.

[4] Blake, Fay M. and Edith L. Perlmutter. "Libraries in the marketplace: Information emporium or people's university?" Library Journal 99: 108-11, January 15, 1974.

[5] Colwin, Jane. Personal communication to Carol Van Jepmond.

[6] Cooper, Michael D. "The Economics of Information," In Carlos A. Cuadra and Ann W. Luke (Eds.) Annual Review of Information Science and Technology, Vol. 8. American Society for Information Science, 1973.

[7] Cooper, Michael D. and Nancy A. DeWath, The Cost of On-Line Bibliographic Searching, Technical Report ACR-003-75-01. Applied Communication Research, Inc. Palo Alto, Ca., December, 1975.

[8] Cooper, Michael D. and Nancy A. DeWath, "The Cost of On-Line Bibliographic Searching," Journal of Library Automation, Vol. 9, No. 3, September, 1976, pp. 195-209.

[9] "Council and Membership Step into Action," American Libraries, Vol 8, No. 7, July-August, 1977, pp. 377-380.

[10] DeGennaro, Richard. "Pay libraries and user charges," Library Journal, Vol 100, pp.363-367, February 15, 1975.

[11] Doyle, Lauren B. Information Retrieval and Processing. Los Angeles, CA: Melville Publishing Co., 1975.

[12] Elman, Stanley A. "Cost comparison of manual and on-line computerized literature searching," Special Libraries 66(1), January 1975, pp. 12-18.

[13] Henne, Frances E. Comment. In The Present Status and Future Prospects of Reference Information Service. Chicago, IL: American Library Association, 1967.

[14] Gaines, Ervin. "Free library service?" Library Journal, Vol 100, March 1, 1974, pp. 593.

[15] Kearney, A.T. Study of Determinants of Organizational Usage of Scientific and Technical Information. National Science Foundation Cooperative Agreement CG-00009, August 1976.

[16] Knight, D.M. and E.S. Nourse (Eds.) Libraries At Large. New York: Bowker, 1969.

[17] Lancaster, F.W., The Measurement and Evaluatioon of Library Services, Information Resources Press, Washington D.C., 1977.

[18] Investigation of the Public Library as a Linking Agent to Major Scientific, Educational, Social and Environmental Data Bases: Two-Year Interim Report, Lockheed Missiles & Space Company, Inc., LMSC-D502595, October, 1976.

[19] Martin, Susan K. Library Networks, 1976-1977. Knowledge Industry Publications, Inc. White Plains, N.Y. 10604, 1976.

[20] Mayhew, Lewis B. Computerized Networks Among Libraries and Universities: An Administrator's Overview. Stanford University, ERIC Clearinghouse on Information Resources. (ERIC ED 115-220).

[21] "It all boiled down to money," Library Journal, March 15, 1977.

[22] Rogers, Everett. Diffusion of Innovations, The Free Press, New York, 1962, p. 176.

[23] Simmons, Peter. "Library Automation" In C.A. Cuadra (Ed.) Annual Review of Information Science and Technology, Vol. 8, 1973.

[24] "The Key Word Was Access," Library Journal, Vol. 102, No.12, August 1977, pp. 1555-157?.

[25] U.S. National Commission on Libraries and Information Science. Towards A National Program for Library and Information Services: Goals for Action. Washington, D.C., Government Printing Office, 1975.

[26] U.S. National Commission on Libraries and Information Science. Evaluation of the Effectiveness of Federal Funding of Public Libraries, Washington, D.C., Government Printing Office, 1977.

[27] Vantine, Carol. "Fee-Based Information Services Within the Public Library," in Proceedings of the Information Broker/Free Lance Librarian--New Carrers--New Library Services Workshop Held in Drumlins, Syracuse, New York, Barbara B. Minor. ed., Syracuse Iniversity, August, 1976.

[28] Warnken, Kelly. The Directory of Fee-Based Information Services 1977. Information Alternative, P.O. Box 657, Woodstock, NY 12498.

[29] Wax, David M. "NASIC and the Information Services Librarian: Room in the Middle,"In Proceedings: Applications of Minicomputers to Library and Related Problems .F. Wilfrid Lancaster (Ed.) Urbana-Champaign, IL: University of Illinois Graduate School of Library Science, 1975.

[30] Weber, David C., "Resource Sharing Prospects," News Notes to the California Libraries, Vol. 70, No. 1-4, 1975, pp3-13.

[31] Williams, Martha E. "Machine-readable data bases in libraries. Criteria for selection and use" In Proceedings: Applications of Minicomputers to Library and Related Problems. F. Wilfrid Lancaster (Ed.) Urbana-Champaign, Ill: University of Illinois Graduate School of Library Science, 1975.

[32] Williams, Martha E., "Data Bases--A History of Developments and Trends from 1966 Through 1975," Journal of the American Society for Information Science, Vol. 28, No. 2, March, 1977, pp. 71-78.

[33] "White House Conference planning sessions held." Library Journal, May 1, 1977, PP. 967-68.

[34] Wright, C. "Current developments in federal support for libraries in the United States," Libri 26(2), June 1976, pp. 96-107.

[35] Zweizig, Douglas and Brenda Dervin, "Public Library Use, Users Uses: Advances in Knowledge of the Characteristics and Needs of the Adult Clientele of American Public Libraries," in Advances in Libraries, Volume 7, M.J. Voight and M.H. Harris, eds., Academic Press, New York, 1977.

APPENDIX I

DIALIB Statistical Tables

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TABLE 1

Average Off-Line Search Preparation Time By Library (Year 3)
Percent of Searches

Minutes	Cupertino (N=22)	San Mateo (N=62)	San Jose (N=242)	Total (N=326)
0 - 5	59.1 %	41.9 %	5.4 %	15.6 %
5 - 10	18.1	8.0	25.2	21.7
15 - 25	22.7	19.4	51.3	43.2
30 - 35	-	9.7	11.2	10.1
40 - 45	-	8.1	4.6	4.9
50 - 65	-	6.4	1.7	2.1
70 - 90	-	6.5	0.8	2.1
TOTAL	99.9	100.0	100.2	99.7

Of interest

The large amount of off-line preparation time per search for San Jose compared to the other libraries.

TABLE 2

Time For Patron To Receive Citations by Library (Year 3)
Percent of Searches

Days	Cupertino (N=5)	San Mateo (N=16)	San Jose (N=74)	Total (N=95)
1	0.0 %	12.5 %	13.5 %	12.6 %
2 - 7	100.0	56.4	79.7	76.8
8 - 14	0.0	25.0	5.5	8.5
15 - 21	-	-	-	-
22 - 42	-	-	-	-
0 or No Response	0.0	6.3	1.4	2.1
TOTAL	100.0	100.2	100.1	100.0

Of interest

The large percentage of searches for San Mateo that had a delay of 8-14 days.

TABLE 3

Occupation of Client by Library (Year 3)

	Cupertino (N=22)	San Mateo (N=62)	San Jose (N=242)	Total (N=326)
Technical Professional	4.5	3.2	11.2	9.2
Graduate Student	9.1	25.8	24.4	23.6
College Undergraduate Student	9.1	12.9	2.9	5.2
Education	18.2	11.3	32.6	27.6
Librarian	4.5	9.7	4.1	5.2
Professional (e.g., M.D., Lawyer, Psychologist)	9.0	6.4	2.1	3.4
Scientist or Research	9.1	0.0	0.8	1.2
Business Professional	4.5	11.3	7.0	7.7
Skilled Labor	0.0	3.2	0.4	0.9
Social Worker	4.5	3.2	0.4	1.2
Counselor/Therapist	4.5	0.0	4.6	3.6
Other (Nurse, Police, Priest, Salesman, Secretary, Writer, Farmer, Clerk)	4.5	6.4	4.0	4.5
No Response	18.2	6.5	5.4	6.4
TOTAL	99.7	99.9	99.9	99.7

Of interest

The variation in client occupations between libraries.

TABLE 4

Reason for Online
Search by Library (Year 3)

	Cupertino (N=22)	San Mateo (N=62)	San Jose (N=242)	Total (N=326)
Job	36.4	25.8	24.4	25.5
Research Paper	36.4	40.3	45.0	43.6
Personal Interest	9.1	0.0	2.1	2.1
School Assignment	0.0	12.9	9.9	9.8
Advanced Degree Work	0.0	9.7	6.2	6.4
Business Related	0.0	0.0	1.2	0.9
Research and Development	0.0	1.6	0.0	0.3
Teaching	0.0	0.0	0.4	0.3
No Response	18.2	9.7	10.7	11.0
TOTAL	100.1	100.0	99.9	99.9

Of Interest

Variation between Cupertino and other libraries, particularly in job and personal interest.

TABLE 5

Estimated Frequency of Library Use
by Online Search Patrons by Library (year 3)

Frequency	Cupertino (N=5)	San Mateo (N=16)	San Jose (N=74)	Total (N=95)
Daily	20.0%	12.5%	0.0%	3.2%
Weekly	0.0	18.8	17.6	16.8
Several Times a Month	0.0	18.8	32.4	28.4
Monthly	0.0	18.8	16.2	15.8
Several Times a Year	40.0	25.0	25.7	26.3
Not at All	20.0	0.0	5.4	5.3
No Response	20.0	6.3	2.7	4.2
TOTAL	100.0	100.2	100.0	100.0

Of Interest

That some patrons perceive daily use of online search.
The percentage of patrons that perceive weekly use.

TABLE 6

Estimated Frequency of Reference Service Use (Year 3)

Frequency	Cupertino (N=5)	San Mateo (N=16)	San Jose (N=74)	Total (N=95)
Daily/Weekly	0.0 %	0.0 %	4.1 %	3.2 %
Several Times a Month	0.0	12.5	14.9	13.7
Monthly	0.0	18.8	17.6	16.8
Several Times a Year	40.0	31.3	43.2	41.1
Not at All	40.0	25.0	17.6	20.0
No Response	20.0	12.5	2.7	5.3
TOTAL	100.0	100.1	100.1	100.1

TABLE 7

Estimated Frequency of Future Online Search Use (Year 3)

Frequency	Cupertino (N=5)	San Mateo (N=16)	San Jose (N=74)	Total (N=95)
Daily/Weekly	- %	- %	- %	- %
Several Times a Month	0.0	12.5	2.7	4.2
Monthly	0.0	0.0	8.1	6.3
Several Times a Year	100.0	68.8	75.7	75.8
Not at All	0.0	12.5	5.4	6.3
No Response	0.0	6.3	8.1	7.4
TOTAL	100.0	100.1	100.0	100.0

TABLE 8
Value of Search
to Patron (Year 3)

Value of Search	Cupertino (N=5)	San Mateo (N=16)	San Jose (N=74)	Total (N=95)
Major Value	20.0	25.0	28.4	27.4
Considerable Value	80.0	43.8	48.6	49.5
Minor Value	0.0	25.0	16.2	16.8
No Value	0.0	6.3	6.8	6.3
TOTAL	100.0	100.1	100.0	100.0

Of Interest

Large percentage of major and considerable value responses.

TABLE 9

Sufficient References Provided
to Answer Question Adequately (Year 3)

Question Answered Adequately?	Cupertino (N=5)	San Mateo (N=16)	San Jose (N=74)	Total (N=95)
Yes	80.0	31.3	62.2	57.9
No	0.0	62.5	37.8	40.0
No Response	20.0	6.3	0.0	2.1
TOTAL	100.0	100.1	100.0	100.0

Of Interest

Difference between libraries.

TABLE 10

Source Through Which Patron
Heard About OnLine Search Service
Availability (Year 3)

Source	Cupertino (N=22)	San Mateo (N=62)	San Jose (N=242)	Total (N=326)
Public Librarian	4.5	29.0	21.1	21.5
Friend	36.4	22.6	27.7	27.3
Notice in Public Library	13.6	11.3	4.1	6.1
Newspaper	0.0	1.6	0.8	0.9
Mailed Notice	4.5	0.0	0.4	0.6
College Librarian	4.5	4.8	3.3	3.7
Teacher	4.5	12.9	16.1	14.7
CIN Mailing	0.0	0.0	0.4	0.3
No Response	31.8	17.7	26.0	24.8
TOTAL	99.8	99.9	99.9	99.9

Of Interest

Large number of teachers as source in San Mateo and San Jose.

TABLE 11

Data Base Use (Year 3)

Data Base	# Times Used	% of Total Use*
ERIC	146	32
Psychological Abstracts	95	21
NTIS	41	9
ABI/INFORM	29	6
Engineering Index/Compendix	27	6
Dissertation Abstracts	22	5
Social Science Citation Index	22	5
NAL-CAIN	21	5
INSPEC	17	4
Chemical Abstracts	11	2
Sociological Abstracts	7	2
Biological Abstracts	5	1
AIM-ARM	4	1
Predicasts F & S	3	1
CAB	2	1
CMA-EMA	2	1
Other	2	1
Predicasts	2	1
SciSearch	2	1
BIOSIS	1	1
CEC	1	1

NOTE: The three most heavily used data bases account for 63% of the total data base use. The seven most frequently used bases account for 84% of the volume, and the eleven most frequently used data bases account for 96% of the total volume.

*Rounded to nearest whole percent

TABLE 12

Client Cost Data (Year 3)

Cost Range($)	# Searches	% Searches*	Cum. #	Cum. %*
0-4.99	33	11	33	11
5-9.99	82	27	115	38
10-14.99	70	23	185	61
15-19.99	42	14	227	75
20-24.99	26	9	253	84
25-29.99	14	5	267	89
30-39.99	15	5	282	94
40-49.99	7	2	289	96
50+	12	4	301	100

no cost given for 25 searches

*Rounded to nearest whole percent

TABLE 13

Number of Database Searches
(percentage of total) (Years 1,2,and 3)

Data Base	Year 1 (N=2222)		Year 2 (N=938)		Year 3 (N=462)	
NTIS	471	(21.1)	108	(11.5)	41	(8.9)
Psych. Abs.	357	(16.0)	180	(19.2)	95	(20.6)
ERIC	344	(15.5)	232	(24.7)	146	(31.6)
Social Science Citations	239	(10.7)	58	(6.2)	22	(4.8)
Engineering Index/ Compendix	206	(9.3)	101	(10.7)	27	(5.8)
Inspec	148	(6.7)	41	(4.8)	17	(3.7)
Chem. Abs.	145	(6.5)	55	(5.8)	11	(2.4)
ABI/INFORM	108	(4.9)	33	(3.5)	29	(6.3)
NAL/CAIN	101	(4.5)	26	(2.8)	21	(4.5)
PANDEX	40	(1.8)	-	-	-	-
CMA/EMA	27	(1.2)	9	(1.0)	2	(.4)
Predicast F & S	18	(.8)	15	(1.6)	5	(1.0)
AIM/ARM	12	(.5)	34	(3.6)	4	(.9)
Exceptional Children/CEC	4	(.2)	8	(.8)	1	(.2)
CLAIMS/CHEM	2	(.2)	1	(.1)	-	-
Biological Abs./BIOSIS	-	-	24	(2.5)	6	(1.2)
SCISEARCH	-	-	9	(1.0)	2	(.4)
Oceanic Abstracts	-	-	3	(.3)	-	-
ISMEC	-	-	1	(.1)	-	-
Dissertation Abs.	-	-	-	-	22	(4.8)
Sociological Abs.	-	-	-	-	7	(1.5)
CAB					2	(.4)
TOTAL		99.9		100.2		99.4

Of Interest

Decrease in NTIS vs increase in ERIC

TABLE 14

Cost of Search to Patron (Years 2 and 3)

Cost (in dollars)	Year 2 (N=611)	Year 3 (N=326)
0 - 4.99	25.9 %	10.1%
5 - 9.99	35.4	25.2
10 - 14.99	10.5	21.5
15 - 19.99	8.2	12.9
20 - 24.99	2.6	8.0
25 - 29.99	1.6	4.3
30 - 39.99	2.5	4.6
40 - 49.99	1.8	2.1
> 50	-	3.7
Standard*	4.1	-
No response	7.5	7.7
TOTAL	100.1	100.1

* The Standard Search was a search of a single data base providing a maximum of 20 citations. It was offered during year 2 for a flat fee of $5.

TABLE 15

Average Off-Line Search Preparation Time (Years 1,2 & 3)

Minutes	Year 1 (N=1236)	Year 2 (N=611)	Year 3 (N=326)
0	45.7 %	19.3 %	15.6 %
5 - 10	26.8	18.0	21.7
15 - 25	17.3	33.6	43.2
30 - 35	5.6	14.3	10.1
40 - 45	1.3	6.3	4.9
50 - 65	2.1	6.4	2.1
70 - 90	1.2	2.4	2.1
TOTAL	100.0	100.3	99.7

TABLE 16

Time for Patron to Receive Citation (Years 1,2 & 3)

Days	Year I N=443	Year II N=161	Year III N=95
1	8.6 %	8.7 %	12.6 %
2 - 7	49.4	70.2	76.8
8 - 14	28.9	13.6	8.5
15 - 21	6.7	4.3	-
22 - 42	4.3	3.2	-
TOTAL	97.9	100	97.9

Of Interest

Decrease in time for patron to receive citation from Year I to year III.

TABLE 17

Sources Through Which Documents are Obtained (Years 1,2 & 3)

Source	Year 1 (N=443)	Year 2 (N=161)	Year 3 (N=95)
Library at Which Online Search is Made	29.9 %	22.4	24.2
College Library	21.9	44.1	45.3
Stanford University	11.1	5.6	4.2
Branch Library	8.9	8.1	5.3
Bookstore	4.7	3.1	-
Company Library	4.2	1.9	4.2
San Mateo County Office of Education	3.0	1.9	-
NTIS	3.0	3.1	4.2
Publisher	1.1	2.5	-
State Mental Health Department	.8	1.2	-
Government Printing Office	.8	-	-
State Department of Education	.6	-	-
Agency Library	.6	-	-
U.S. Geological Survey	.6	-	-
San Mateo County Health and Welfare Department	.6	1.2	-
San Mateo County Law Library	.3	-	-
Authors Directly	.3	1.2	-
Patent Office	.3	-	-
State Game Department	.3	.6	-
Personal Collection	-	.6	-
Veterans Administration Medical Library	-	.6	-
Pacific Southwest Forest and Range Experiment Station	-	-	1.1
No Response	7.0	1.9	11.5
TOTAL	100	100	100

TABLE 18

Occupation of Search Patrons (Years 1,2 & 3)

Occupation	Year 1 (N=1236)	Year 2 (N=611)	Year 3 (N=326)
Technical professional	14.7 %	12.3	9.2
Graduate Student	13.6 %	18.2	23.6
College Undergraduate Student	12.9 %	9.3	5.2
Education	13.2	16.9	27.6
Librarian	6.5	8.3	5.2
Professional	5.4	5.7	3.4
Scientist or Research	5.4	3.4	1.2
Business Professional	3.9	4.9	7.7
Skilled Labor	1.5	.3	0.9
Small Business Owner	1.5	-	-
Social Worker	1.3	1.8	1.2
Counselor/Therapist	.7	2.0	3.6
Other	8.1	6.3	4.5
No Response	11.2	10.8	6.4
TOTAL	99.9	100.2	99.7

Of Interest

Change in patron occupation over the 3 year period.

TABLE 19

Reason For Online Search (Years 1,2 & 3)

Reason for Search	Year 1 (N=1236)	Year 2 (N=611)	Year 3 (N=326)
Job	33.4	21.1	25.5
Research Paper	32.6	48.3	43.6
Personal Interest	7.9	5.7	2.1
School Assignment	4.9	7.4	9.8
Advanced Degree Work	3.1	6.3	6.4
Business Related	2.3	-	0.9
Research & Development	1.8	.6	0.3
Book	1.4	.6	-
Teaching	.4	-	0.3
No Response	12.2	10.0	11.1
TOTAL	100	100	100

TABLE 20

Level of Education
of Online Search Patron (Years 1,2 & 3)

Level of Education	Year 1 (N=443)	Year 2 (N=611)	Year 3 (N=326)
Ph.D. or M.D.	13.8	5.9	6.4
Masters Degree	26.2	17.8	19.6
Graduate Student	28.2	33.4	38.7
College Graduate	15.1	11.8	16.9
College Student	11.5	9.7	5.2
High School Graduate	.7	-	1.2
High School Student	1.1	.3	-
No Response	3.4	21.1	12.0
TOTAL	100	100	100

Of Interest
Increased use by graduate students over 3 year period.

TABLE 21

Estimated Frequency of Library Use
by Online Search Patron (Years 1,2 & 3)

Frequency	Year 1 (N=443)	Year 2 (N=161)	Year 3 (N=95)
Daily	4.9	6.2	3.2
Weekly	31.7	26.7	16.8
Several Times a Month	22.4	17.4	28.4
Monthly	20.2	14.3	15.8
Several Times a Year	15.3	26.7	26.3
Not at All	2.2	3.7	5.3
No Response	3.3	5.0	4.2
TOTAL	100	100	100

TABLE 22

Estimated Frequency of Reference Service Use (Years 1,2 & 3)

Frequency	Year 1 (N=443)	Year 2 (N=161)	Year 3 (N=95)
Daily/Weekly	7.0	6.8	3.2
Several Times a Month	15.6	13.0	13.7
Monthly	14.9	10.6	16.8
Several Times a Year	42.2	48.4	41.1
Not at All	14.7	13.0	20.0
No Response	5.6	8.2	5.2
TOTAL	100	100	100

TABLE 23

Estimated Frequency of Future Online Search Use (Years 1,2 & 3)

Frequency	Year 1 (N=443)	Year 2 (N=161)	Year 3 (N=95)
Daily/Weekly	2.0	.6	-
Several Times a Month	8.1	3.1	4.2
Monthly	15.6	6.2	6.3
Several Times a Year	67.3	81.4	75.8
Not at All	2.7	3.1	6.3
No Response	4.3	5.6	7.4
TOTAL	100	100	100

TABLE 24

Value of Search to Patron (Years 1,2 & 3)

Value of Search	Year I (N=443)	Year II (N=161)	Year III (N=95)
Major Value	22.1	26.7	27.4
Considerable Value	46.5	47.2	49.5
Minor Value	23.3	21.7	16.8
No Value	6.8	3.7	6.3
No Response	1.4	.6	0.0
TOTAL	100.1	99.9	100.0

Table 25

Sufficient References Provided
To Answer Question Adequately (Years 1,2 & 3)

Question Answered Adequately ?	Year I (N=443)	Year II (N=161)	Year III (N=95)
Yes	53	59.6	57.9
No	42.4	39.1	40.0
No Response	4.5	1.2	2.1
TOTAL	99.9	99.9	100.0

TABLE 26

Number of Citations of Use to Patron (Years 1,2 & 3)

Number of Citations	Year 1 (N=443)	Year 2 (N=161)	Year 3 (N=95)
0	17.8	12.4	20.0
1 - 5	30.0	24.9	29.6
6 - 10	15.3	16.7	17.0
11 - 15	9.4	8.1	7.5
16 - 20	5.3	6.1	7.5
21 - 50	9.7	21.0	15.0
More than 50	12.4	10.5	4.4
TOTAL	99.9	99.7	101.0

TABLE 27

Source Through Which Patron Heard About Online Search Service Availability (Years 1,2 & 3)

Source	Year 1 (N=1236)	Year 2 (N=611)	Year 3 (N=326)
Public Librarian	23.1	23.9	21.5
Friend	21.0	22.3	27.3
Notice in Public Library	13.6	8.3	6.1
Newspaper	10.7	2.3	0.9
Mailed Notice	4.9	1.0	0.6
College Librarian	4.4	7.9	3.7
Teacher	2.5	17.7	14.7
Small Business Seminar	1.2	-	-
CIN Mailing	1.1	1.5	0.3
Club Meeting		0.3	-
No Response	17.5	14.9	24.8
TOTAL	100.0	100.1	99.9

APPENDIX II

THE EFFECT OF USER FEES ON THE COST OF ON-LINE SEARCHING IN LIBRARIES

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ABSTRACT

This study presents a comparative analysis of the time and cost of online searching in four public libraries in California, both for free service and when a fee is charged. It was found that when service is free to the user, the average cost of a search is $28.68, and when a fee is charged the average cost dropped to $26.44. This is primarily due to an increase in librarian pre-search and post-search time of about 6 minutes per search, and a decrease of about 7 minutes in online time. (Librarian time costs about $.10 per minute, while online search service time is about $.70 a minute.)

A second finding was that time and cost differences between pairs of libraries decreased in the pay period, i.e., there was greater conformity among libraries. This leads one to believe that our results are of value in predicting the time and cost of online searching for a fee in other public libraries.

THE EFFECT OF USER FEES ON THE COST OF ON-LINE SEARCHING IN LIBRARIES

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INTRODUCTION

Libraries and information dissemination agencies that have implemented or are contemplating on-line bibliographic searching services are faced with the need to evaluate the effects of offering such a service. This paper compares the costs that libraries incur in providing the service under two conditions: when the service is free to the user, and when the user has to pay a fee for the service.

Traditionally, many library services are provided to patrons without charge. Presumably this is done because library service has benefits to the community in excess of the benefits received by the individual patron, and also perhaps, because a unit of library service is not easily identifiable or measurable in order to apportion charges. The introduction of on-line bibliographic searching, however, makes the issue of whether to charge the user for new library services more complex. The library, in providing on-line bibliographic search facilities, is acting as an intermediary between the user and a commercial vendor. Each time a search is run a charge from the search service vendor is incurred. Secondly, search requests are unique in that their results can not usually be used by other library patrons, in contrast to library services such as the provision of books, serials, etc. Thirdly, the service costs are easily indentifiable.

In order to make a rational decision about charging or not charging for on-line searching services, a number of issues need to be considered:

1. Should fees be charged for all or part of these library services, and if so which parts?

2. Will individuals who need on-line searching services be deterred by imposition of fees ?

3. Does charging a fee for on-line searching result in more efficient and/or better quality searching on the part of the library staff?

4. Should library administrators be influenced in their resource allocation decisions by the fact that users are willing to pay for on-line searching? Would the long-range consequences of this be to shift library service into paying activities or away from paying activities?

5. Should online searching be supported only out of search-generated revenues, as are photocopy services?

6. How should prices be set for the services if it is decided to charge the user?

These are but a few of the many issues that a library must resolve in deciding to implement user charges. In this paper we concentrate on the question of how the introduction of fees for library services impacts the library's resources in terms of staff time and costs to the library of providing the services. The paper draws on experience from the Lockheed Cooperative Information Network DIALIB project.

The DIALIB Project has been reported elsewhere in the literature [4,5,6]. The project has been offering Lockheed DIALOG searches to public library patrons in the San Francisco Bay Area since 1974. During the first two years of the project (June 1974 to May 1976), four public libraries (Redwood City Public Library, San Jose Public Library, Santa Clara County Library, and San Mateo County Library) performed searches using regular reference staff who had been trained in DIALOG searching. During the first year DIALOG charges were paid in full by a National Science Foundation (NSF) grant and the libraries contributed the necessary staffing. During the second year, the grant covered half the connect charges by the search service vendor and the libraries passed on the other half to the users. The libraries were compensated by NSF for their staff time at the rate of $10 for each hour that the staff spent on the terminal.

During the pay period, users of the on-line searching services could have a 'standard' or a 'custom' search performed. The standard search cost $5 and was limited to one data base, a maximum of ten search sets (combinations of logical operations and index terms), and 20 off-line prints. For a custom search the user paid half the actual data base charges incurred as well as half the off-line print charges. Only 14 percent of the searches performed during the entire second year of the project were standard searches.

METHODOLOGY

In a previous paper, Cooper and DeWath [1,2] analyzed the cost of providing on-line searching when the service was free to all users. The current study extends the analysis by investigating the costs during the pay period and statistically comparing the pay and free periods.

The two hypotheses tested in this paper were:

1. That within each library, the differences in the time and cost of a search between the free and pay periods are not significant.

2. That within the pay period and within the free period, the differences in the time and cost variables between pairs of libraries are not significant.

The statistical methodology used compared the mean values of the time and cost variables using contrasts. Each contrast compares the mean values of a given variable for two groups, and tests to see whether the difference is statistically significant. (For a detailed discussion of the statistical tests, see Appendix A.)

In the presentation of the experimental results, we will indicate whether a comparison between free and pay period variables or between two libraries' variables, was significant. This means that the statistical test described above was employed and that the contrasts between the means were significant. Any exceptions to this procedure will be noted.

Differences between Free and Pay Periods

The methodology used in the present study was kept as similar as possible to that of the free period cost analysis (1) to make comparisons possible. A time sheet was filled out by library staff members as they performed the various tasks associated with each search. Seven possible tasks were defined -- but not all tasks were necessarily performed for each search.

The seven tasks are defined in detail in [1]. They are:

1. Reference interview: The time spent with the patron defining the question.

2. Originating library preparation: Activities at the originating library, performed without the patron, involving preparing the question prior to relaying it to a DIALOG library.

3. DIALOG library preparation: Activities at the DIALOG library without the user, preparing for the terminal session.

4. Search: The actual on-line search.

5. DIALOG library follow-up: Post-search activities at the DIALOG library with no patron present.

6. Originating library follow-up: Post search activities at the originating library without the patron.

7. Follow-up with patron: The time spent with the patron explaining the results of the search.

In addition, various approaches to online search were identified. Direct access was provided by DIALOG libraries which had terminals and performed searches. Network access was provided by Originating Libraries without a terminal (often branches of a DIALOG library) that might take a request from a patron and relay the request to a DIALOG library for searching.

Each person who processed the request entered his or her initials, the time spent on the request, and the date on the time sheet. The time sheets were collected and analyzed to compute the time and costs per

search. The actual salary schedules for the participants' job classifications, and the DIALOG system's data base fee schedule, were used to compute the costs for each search. The data analysis resulted in both time and cost figures for each of the seven tasks.

The first (free) and second (pay) years of the project differ notably in some areas:

1. During the free period, all the library personnel were relative novices at on-line searching. Those who remained with the project through the second year can be described as relatively experienced searchers, however many first year 'veterans' left and were replaced with novices during the second year. Thirty-one percent of the personnel who participated in these studies were active during both periods. Thus the population of searchers whose activities were analyzed was only partially the same for both periods.

2. Seventeen new data bases were added to the DIALOG system between the end of the first data collection period and the end of the second, so the available information sources were not completely the same between periods.

3. All participants' salaries were increased by cost of living adjustments during the second year. In addition, some of the staff who participated in both periods were promoted, and received commensurate salary increases. Adjustments to allow comparisons in cost between the free and pay period were made for these changes in salary levels. They are discussed later on paper.

4. The nature of the requests may have changed with the institution of fees; the nature of the requestors did change, with relatively more graduate students and fewer undergratuates and professionals requesting searches.

5. In addition, the number of search requests for which cost data were recorded was different from the free period to the pay period.

The free period analysis was based on a sample of 411 of 1929 total searches (21 percent) performed during the first year of the project. The sample consisted of almost all searches from roughly the middle of the first year (January to March 1975). The second year's sample included 359 of the total 581 searches (62 Percent) performed during the second year. The sample consisted of almost all searches performed during the last seven months of the second year (November 1975 to May 1976). Aside from sample size variations, the distribution of the sample among the four libraries varied between the two data collection periods (Table 1). The number of searches performed varied widely from one library to another. (Note particularly that in the second year San Mateo County contributed only 2.5% to the sample.)

Table 1
Sample Size

Library	Free Period		Pay Period		
	Number of Requests	Percent	Number of Requests	Percent	Percent change in number of requests from Free to Pay Period
Redwood City Public Library	138	33.6	84	23.4	-30.3
Santa Clara County Library	103	25.1	118	32.9	+31.1
San Mateo County Library	93	22.6	27	7.5	-66.8
San Jose Public Library	77	18.7	130	36.2	+106.9
Total Sample Size	411	100.0	359	100.0	+12.6

COMPARATIVE ANALYSIS OF FREE AND PAY PERIODS

The previous section outlined some of the conceptual difficulties in comparing the pay period time and cost variables with those of the free period. This section analyzes data base usage, citations printed, time spent on the search, and cost of the search to ascertain whether search characteristics changed between periods.

Data Base Usage and Charges

The same data bases were popular in both the free and pay periods. In the free period, the ERIC, NTIS, and Psychological Abstracts bases accounted for 48 percent of all uses, while in the pay period the same bases accounted for 55 percent of all uses. The ERIC data base showed the greatest amount of increase -- usage increased nine percent between the free and pay periods. (Table 2). Although 17 new bases were added by the search service vendor since the previous study, their availability made little difference in the pattern of data base use.

The comments of the staff members indicated a continual awareness of the cost of the search to the patron during the pay period. [4]. In fact, the participants agitated throughout the study for a DIALOG feature that would give the accumulated cost of a search at any time during the search session by issuing a special DIALOG command. This feature now has been implemented.

Fortunately, there were no differences in data base cost per connect hour between the free and the pay period. Thus, there were no variations in data base costs to influence the use of the data base.

Factors which might have influenced the choice of data bases include the types of requests received and the searcher's preferences among data bases. The searchers indicated that they experienced difficulty in maintaining their competence across the large number of bases available.[5] The observed pattern of limited data base use might be at least partly due to the searcher's choice of the data bases that are [a] easiest to keep current with; (b) most worthy of investment to keep up-to-date with in terms of data base demand or (c) easiest to use without studying changes and data base idiosyncrasies. The relatively low use of some of the more expensive data bases (e.g. the Predicasts bases) may also indicate some discrimination in favor of bases which (in the judgment of the searchers) offer greater value per dollar spent, but it may also reflect the low incidence of business-oriented questions. Although all 18 of the 18 available bases were used by searchers during the free period, only 28 of the 35 available bases were used during the pay period.

Table 2
Data Base Connect Charges and Usage

Pay Period

Data Base Name	Charge Per connect hour	Charge Per Off-Line Print	Total Uses	Percent of Data Base Uses	Change in Percent of Uses from Free to Pay Period
ERIC	$ 25	$ .10	159	22.78	+ 9.43
NTIS	35	.10	119	17.05	- 0.79
Psych.Abstracts	50	.10	107	15.33	- 1.24
COMPENDEX	65	.10	69	9.89	+ 0.60
SSCI	70	.10	42	6.02	- 3.49
Chem.Abstracts	45	.08	35	5.01	- 3.22
ABI/INFORM	65	.10	23	3.30	- 3.32
INSPEC.ELECT ENG.	45	.10	19	2.72	+ 0.58
All other Bases	-	-	125	17.90	+ 1.45
Total	-	-	698	100.00	-

Off-Line Prints

The average number of off-line prints per search rose from 61 citations per search during the free period to 88 in the pay period. (Table 3). The increase was primarily a result of the much higher off-line print averages for two libraries (Santa Clara and San Mateo Counties). Only 18 percent of the searches during the pay period resulted in no prints at all, compared to 32 percent in the free period. Several explanations can be proposed for this increase in the mean value: (a) the librarians were more careful about accepting searches for which they expected to find a fair amount of information, once user fees were instituted; (b) the $0.05 per citation that users were actually charged during the pay period was too low to discourage printing while the high cost of the search encouraged the searcher to print whatever was found, even if it was not highly relevant; (c) most of the searchers were more experienced than during the earlier study and had more success at finding relevant citations.

(Recall that the user paid only half the actual data base charges and half the off-line print charges. Thus the figure $ 0.05 rather than $ 0.10 per citation printed.)

Data Bases

Multiple data bases were sometimes searched for a single request. During the free period an average of 2.3 data bases per search were used, while in the pay period the average was 1.9. Forty-eight percent of all searches in the pay period and 31 percent of the searches in the free period used only one data base. The standard searches accounted for 14 percent of the total. These searches were by definiton limited to one data base which explains most of the variation in the two figures.

It is interesting to note that, during the pay period, the first data base used for a search accounted for only 19 percent of the off-line prints, while the second data base produced 55 percent of the citations printed.

Staff Time

The library staff involvement with a search request neither begins nor ends at the terminal. Considerable time is required for other search-related activities, such as query negotiation, off-line preparation, post-search activities and follow-up with patron (see Tables 4-9).

The total time required to process a request during the pay period averaged 54.9 minutes, which did not differ much from the free period's 48.7 minutes. (Table 4) Two of the libraries did differ significantly from their averages of the previous year. Redwood City more than doubled the average total time spent on each search, from 35.1 minutes during the free period to 67.6 minutes in the pay period; and Santa Clara County decreased the average time spent on each search from 58.3 minutes to 46.9. San Mateo County also showed a dramatic increase of 22 minutes (from 56.2 minutes in the free period to 79.2 minutes in the pay period). However, due to the small number of observations and a large variability among them, this increase is not statistically significant. The San Jose Public Library had a very consistent total search time, recording 48.8 minutes during the pay period and 50.8 minutes during the free period.

Table 3

Mean Number of Off-Line Prints per Search

(all cases)

Library	Free Period	Pay Period	Difference
Redwood City Public Library	79	71	-8
Santa Clara County Library	69	146	+77
San Mateo County Library	29	72	+43
San Jose Public Libray	60	51	-9
Mean Prints Per Search All Libraries	62	88	+26

Table 4

Task	Mean Task Time by Library -- Pay Period								Free Period
	Redwood City	Standard Deviation	Santa Clara	S.D.	San Mateo	S.D.	San Jose	S.D.	Overall** Mean	S.D.	Mean Task Time
Reference Interview	24.04*	14.59	13.03	7.30	16.17	13.28	13.87*	7.89	15.87	10.75	10.50
Originating Library Prep.	-	-	10.00	7.07	17.50	14.64	10.00	0	15.45	12.93	18.65
DIALOG Libr. Prep.	23.50*	13.79	12.80	4.61	27.55	26.05	15.38*	11.41	17.83	13.67	10.48
Search	16.53	12.53	17.16*	14.19	22.27	15.95	13.21*	10.30	15.95	12.84	22.72
DIALOG Libr. Follow-up	18.58*	10.29	14.38*	5.49	22.63*	15.40	10.17	5.68	14.17	8.66	12.21
Originating Library Follow-up	-	-	-	-	10.83	14.29	-	-	10.83	14.29	11.48
Follow-up with Patron	15.00*	9.17	9.46*	3.69	10.67	7.04	9.00	7.04	10.25	7.26	7.61
Total Time Spent on Request-Pay Period	67.60*		46.92*		79.15		48.79				
Total Time Spent on Request-Free Period	35.07		58.28		57.23		50.76				

* Significant difference between free and pay period at family = .05. (see Appendix A).

** Note: Overall means reflect different N's both for libraries and tasks.

Changes in staff time per search are very important. Since the libraries did not charge patrons for staff time, and since there was no additional staff time available, the dramatic shift at Redwood City represents a substantial shift of resources to the search service at the expense of other library operations.

For each of the five tasks that could be compared (two tasks were performed too infrequently to be significant), the time spent was greater in the pay period than in the free period (1) [See Table 4]. Reference Interview time increased from 10.5 to 15.8 minutes, DIALOG Preparation from 10.5 to 17.8 minutes, DIALOG Follow-up from 12.2 to 14.2 minutes, and Follow-up with Patron from 7.6 to 10.3 minutes. Contrasts were performed on the individual libraries' values using means of time and cost variables, and two libraries showed several significant increases in task times. (Table 4).

The off-line tasks were also performed more frequently during the pay period. Most notably the percent of searches having reference interviews increased from 72 percent to 91 percent from one period to the next.

During the pay period 67 percent of the searches involved DIALOG library preparation as opposed to 54 percent during the free period. DIALOG library Follow-up was performed in 84 percent of the pay period searches and 75 percent of the free period searches. There was only one percent difference in the number of Follow-ups with Patrons between periods (43 percent during the pay and 42 percent during the free period).

With regard to staff time, it can be concluded that with the institution of user fees for on-line searching, the librarians are apparently substituting off-line time for on-line time. They are performing the off-line tasks more frequently and taking more time to do them. It is possible to reduce on-line access time (and search services charges) to a certain extent by spending more time off-line structuring the request, using hard copy thesauri, and otherwise preparing for the search so that less time is required to search for synonyms and try various possible search formulations on-line. It appears that the librarians did just that.

Search Costs

The total cost of an on-line search includes the payment to the search service vendor for data base connect charges and off-line citation printing. It also includes the direct salary costs for the individuals who process the search request. Other possible costs that can be considered, but were not included in the calculations below, include telephone line charges, terminal rental, and overhead. The search service cost calculations reflect those costs actually incurred and not those costs charged to the patron. (Recall that under the terms of the NSF grant, the user, even during the pay period, only paid half of the charges for a custom search.)

Twenty-eight library staff members, ranging from clerks through supervising librarians, participated at some point in the search process during the sampled pay period. This compares with 40 people during the free period. Their average salaries during the pay period are given in Table 5 along with their average salaries during the free period. For all staff involved in the searching process, salaries increased by 9.5 percent between the two periods. Aside from the general salary increase between periods, there were shifts in the number of people in a particular job

classification who were involved in the searching. For example, the number of Librarian I's declined from 19 in the free period (47.5 percent of the total staff) to 11 in the pay period (39.3 percent). Similarly the number of Librarian II's declined from 11 in the free period to 8 in the pay period, although the overall percentage of library employees in that classification remained steady at about 28 percent.

The average costs reported in Tables 6 and 7 are calculated from the actual costs of each reported search, based on the time required, the individuals performing the tasks, the data bases used, and the number of citations printed off-line. In order to provide valid cost comparisons between the free and the pay period, all of the costs for free period searches were recalculated using data base charges, off-line print charges, and salaries that were in effect during the pay period rather than the free period.

For example, for a particular free period search, the salary of the searcher might have increased from $ 1000 to $ 1100 per month between the two periods. In computing the adjusted free period cost of the search, the $ 1100 salary would be used. In general, salaries of individuals involved in a free period search were adjusted by using equivalent pay period salaries corresponding to the individual's job title. The effect of the process is to change free period search costs into constant dollars that can be compared to the pay period costs in consistent manner. After adjustment, the differences between free and pay period costs are due to the different time requirements of the various tasks, changes in job classifications of the searches, choice of data bases, and number of citations printed.

Table 6 summarizes the major cost elements of a search for both the free and pay period in 'pay period dollars', and Table 7 breaks down the labor costs according to the various tasks. Table 6 shows that labor costs for all the search tasks except the actual search have increased. (Comparisons for Originating Library Preparation and Originating Library Follow-up should be ignored since the number of observations is not adequate to make valid comparisons.)

For example, the cost of reference interview labor increased from $1.12 during the free period to $1.72 during the pay period. Similarly, the labor cost for follow-up with the user increased from $.81 in the free period to $1.15 in the pay period. Search labor costs, however, decreased from $2.43 in the free period to $1.74 in the pay period. (1)

It is interesting to note that the adjustment of the free period costs into constant dollars results in a very small change in the actual search labor costs. For example, the greatest change in any search labor cost figure in Table 5 was $0.14 for one task. Although adjusting the costs into constant dollars in this experiment made little difference in the values, if the time difference between observations had been greater, the effect would obviously have been more noticable.
least with respect to costs.

Table 5

Salary Schedule

Job Title	Mean Monthly Salary		Number of Participants	
	Free Period	Pay Period	Free Period	Pay Period
Typist Clerk	-	$ 821.00	-	2
Library Assistant I	$ 658.00	706.00	3	2
Library Assistant II	782.50	976.50	2	2
Librarian I	980.25	1082.25	19	11
Librarian II	1080.25	1171.25	11	8
Librarian III and above	1233.80	1340.80	5	3

Table 6 shows some major cost shifts between the free and the pay periods. Data base charges declined from $17.35 in the free period to $11.60 in the pay period, and off-line print charges increased from $8.83 to $10.87. Labor costs for all search activities increased between the two periods. Total search cost declined from $ 28.68 in the free period (constant dollars) to $24.81, reflecting mainly the decline in data base charges in the pay period. Among the libraries there are small shifts in costs for two of the libraries and large changes for two others. The number of observations for San Mateo County is relatively small and variability is quite large, so the large change in cost should be treated with caution. Only San Jose Public Library shows a significant decrease in total search cost.

The cost figures reinforce the findings of the time figures; the cost of the on-line search itself has been reduced, but the cost of related activities has risen as the librarians spend more time at them so that the overall cost of the search is only slightly lower, if at all.

Thus under the pay condition the ratio of staff labor costs to connect and print costs was higher than under the free condition. This effectively shifted some of costs that would have been paid by the user to the library (in the form of staff costs).

Patron Presence During Search

The user was invited to be present while the search was conducted much more frequently during the pay period (50 percent of the searches) than the free period (15 percent). This supports a finding by Wanger [7] that more experienced searchers tend to be more inclined to allow the user to participate in the search than less experienced searchers. The librarians in the DIALIB project who preferred to have the user present noted that the user can often provide useful information during a search, evaluate the results as they appear, and help to alter the course of the search if required. In addition, a user who has seen what is and is not available on-line is more likely to be satisfied with the results. Those searchers who preferred not to have the user present felt that the user tended to slow the search down because of unfamiliarity with the system.

The time impact of the user's presence on the search was considerably less pronounced during the pay period. During the free period the average time at the terminal with the patron present was 33.85 minutes and 20.93 minutes with the patron not present. During the pay period similar figures were 16.51 minutes and 15.38 minutes. The only significant difference in search time with and without the user present for libraries in the pay period was for Redwood City, where the time for a search was 24.83 minutes, or 43 percent longer when the patron attended the search.

Some care is needed in interpreting time differences due to patron presence at the search. Mitigating factors could confound the results -- searches with the patron could have been more complex than others, or perhaps the client's presence indicates anticipated problems. It is also possible that those users present during a search were in some way more demanding, requiring more of the librarian's time. It appears however that fears that the patron will slow down the search are not justified.

Table 6

Search Cost

Cost Element	Mean Task Cost By Library-Pay Period					Mean Task Cost-Free Period in Constant Dollars
	Redwood City	Santa Clara County	San Mateo County	San Jose Public	Overall Mean	
Data Base Charges	11.83	13.30*	18.22	8.60*	11.60	17.35
Off-Line Print Charges	8.14	17.78	8.16	6.54*	10.87	8.83
Search Labor Cost	1.88	1.79*	2.17	1.50*	1.74	2.43
Labor Cost for All other Tasks	5.98*	3.30	7.17	4.58*	4.68	2.98
Total Cost of Search Pay Period**	26.46	33.37	33.15	19.55	26.44	28.68
Total Cost of Search Free Period	25.40	35.84	19.77	36.15	26.44	

*Significant difference between free and pay period at family =.05 (see Appendix A).

** Totals are not additive due to differences in the number of observations in each cell. For detailed breakdown, see Table 9.

Table 7

Mean Salary Cost for Task by Library
(in Dollars)

Task	Mean Task Cost By Library-Pay Period					Mean Task Cost-Free Period in Constant Dollars
	Redwood City	Santa Clara County	San Mateo County	San Jose Public	Overall Mean	
Reference Interview	2.63	1.35	1.79	1.56	1.72	1.12
Originating Library Preparation	-	1.03	1.90	1.06	1.66	1.96
DIALOG Library Preparation	2.54	1.32	3.04	1.69	1.93	1.06
Search	1.88	1.79	2.17	1.50	1.74	2.43
DIALOG Library Follow-up	2.03	1.49	2.66	1.10	1.53	1.26
Originating Library Follow-up	-	-	1.21	-	1.21	1.08
Follow-up with Patron	1.65	.97	1.23	1.05	1.15	.81

Table 8a

Staff Cost Calculations for Tasks

Redwood City

	Mean Time in minutes	Mean Cost in dollars	Cost/Hour in dollars
Reference Interview	24.04	2.63	6.56
Originating Library Preparation	-	-	-
DIALOG Library Preparation	23.50	2.54	6.49
Search	16.53	1.88	6.82
DIALOG Library Follow-up	18.58	2.03	6.56
Originating Library Follow-up	-	-	-
Follow-up with Patron	15.00	1.65	6.6

Table 8b

Staff Cost Calculations for Tasks

Santa Clara

	Mean Time in minutes	Mean Cost in dollars	Cost/Hour in dollars
Reference Interview	13.03	1.35	6.22
Originating Library Preparation	10.00	1.03	6.18
DIALOG Library Preparation	12.80	1.32	6.19
Search	17.16	1.79	6.26
DIALOG Library Follow-up	14.38	1.49	6.22
Originating Library Follow-up	-	-	-
Follow-up with Patron	9.46	.97	6.15

Table 8c

Staff Cost Calculations for Tasks

San Mateo

	Mean Time in minutes	Mean Cost in dollars	Cost/Hour in dollars
Reference Interview	16.17	1.79	6.64
Originating Library Preparation	17.50	1.90	6.51
DIALOG Library Preparation	27.55	3.04	6.62
Search	22.27	2.17	5.85
DIALOG Library Follow-up	22.63	2.66	7.05
Originating Library Follow-up	10.83	1.21	6.70
Follow-up with Patron	10.67	1.23	6.92

Table 8d

Staff Cost Calculations for Tasks

San Jose

	Mean Time in minutes	Mean Cost in dollars	Cost/Hour in dollars
Reference Interview	13.87	1.56	6.75
Originating Library Preparation	10.00	1.06	6.36
DIALOG Library Preparation	15.38	1.69	6.59
Search	13.21	1.50	6.81
DIALOG Library Follow-up	10.17	1.10	6.49
Originating Library Follow-up	-	-	-
Follow-up with Patron	9.00	1.05	7.00

Table 8e

Staff Cost Calculations for Tasks

	Pay Period			Free Period		
	Task Time in minutes	Cost in dollars	Cost/Hour in dollars	Mean Task Time	Cost in dollars	Cost/Hour in dollars
Reference Interview	15.87	1.72	6.50	10.50	1.12	6.40
Originating Library Preparation	15.45	1.66	6.45	18.65	1.96	6.31
DIALOG Library Preparation	17.83	1.93	6.49	10.48	1.06	6.07
Search	15.95	1.74	6.55	22.72	2.43	6.42
DIALOG Library Follow-up	14.17	1.53	6.48	12.21	1.26	6.19
Originating Library Follow-up	10.83	1.21	6.70	11.48	1.08	5.64
Follow-up with Patron	10.25	1.15	6.73	7.61	.81	6.39

Table 9

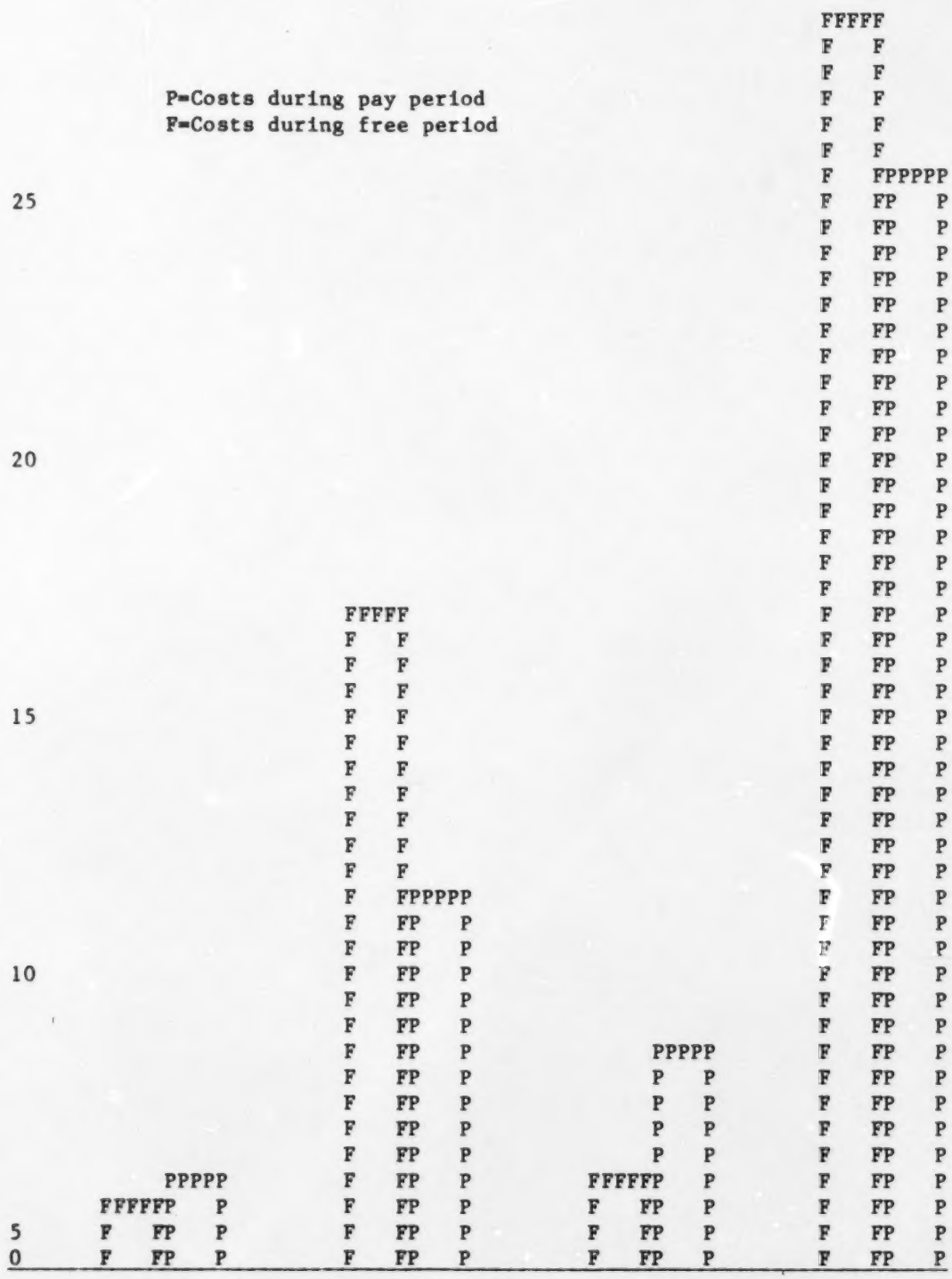
AVERAGE COST OF ONLINE SEARCH, SHOWING FREE AND PAY PERIODS

SEARCH ELEMENTS	TIME (MIN)		COST ($)		PROBABILITY OF SEARCH ELEMENTS	WEIGHTED COST* ($)	
	Free	Pay	Free	Pay		Free	Pay
Reference Interview with Patron	10	16	1.12	1.72	0.72	0.81	1.24
Originating Library Preparation Time	18	15.5	1.96	1.66	0.11	0.22	0.18
DIALOG Library Preparation Time	10	18	1.06	1.93	0.54	0.57	1.04
Online Retrieval Service Cost	23	16	17.35	11.60	1.0	17.35	11.60
Printing of Citations			8.83	10.87	0.67(free) 0.82(pay)	5.92	8.91
Salary Cost for Online Time			2.43	1.74	1.0	2.43	1.74
Follow-up Time for DIALOG Library	12	14	1.26	1.53	0.74	0.93	1.13
Follow-up Time For Originating Library	11	11	1.08	1.21	0.10	0.11	0.12
Follow-up with Patron	8	10	0.81	1.15	0.42	0.34	0.48
						28.68	26.44

* Not all elements are used for each search, and therefore a weighted cost is used.

Figure 1

AVERAGE COST OF ONLINE SEARCH FOR FREE AND PAY PERIODS
(in dollars)



Elapsed Time

The time required to process a search was compared between the free and the pay period to see if the process was more efficiently performed when the user was paying for the search. There is strong evidence that a considerable reduction in total processing time did take place. During the free period, the elapsed time from performance of the reference interview to completion of the follow-up with the patron was 7.8 days. The average during the sampled searches in the pay period was 4.4 days, for a 44 percent reduction. This reduction may be due to the integration of the DIALOG procedures into other library activities, a more experienced staff during the pay period, as well as perhaps some reduction of search demand during the pay period, which no doubt helped reduce backlog problems considerably.

Table 10 summarizes the total time required to process search requests for the free and the pay period by library. Between the free and pay period, a large reduction in the elapsed time took place between the time a search request was made in a reference interview and the actual search was performed. During the free period this process required 4.9 days while in the pay period it took 2.1 days. The large number of days required for San Mateo County to process requests reflects the geographic dispersion of their branch structure and also the relatively small number of searches performed by them.

Table 10

Elapsed Time to Process a Search Request
(in calendar days)

Period	Mean Elapsed Time, Pay Period					Mean Elapsed Time, Free Period
	Redwood City	Santa Clara County	San Mateo County	San Jose Public	All Libraries	All Libraries
Reference Interview to Online Search	1.1	2.6	6.5	1.3	2.1	4.9
Online Search to Patron Followup	3.0	3.0	5.6	3.3	3.4	4.0
Total Time in System	6.0	4.9	14.7	6.8	7.8	

Note: times are not additive

COMPARISONS BETWEEN LIBRARIES

The discussion to this point has dealt with the first hypothesis, that within a given library the variables differ between the free and the pay periods. We also tested whether the libraries differed significantly from one another during the two periods.

A series of pairwise contrasts was performed on the data for each period, using the mean values for each library for the time and cost variables. Each pair of libraries' values for each of seven major variables within each of two periods was compared.

The results, reported in Table 11, indicate a greater conformity among the libraries during the pay period than during the free period. Table 11a reports the significant contrasts between all possible pairs of libraries during the free period. For example, Redwood City and Santa Clara County proved to be significantly different in their free period values for reference interview time, time at terminal, Dialog library follow-up time, total time for all search-related activities, and total cost of the search. Overall, 21 to 42 tested comparisons proved significant.

Table 11b repeats the analysis for the pay period data. Only 12 of the tested differences proved significant.

Since the major single difference between the two periods was the institution of user fees, it appears that the great change in the number of significant contrasts from the free period to the pay is probably due in part to those fees. Since the movement from one year to another is in the direction of greater conformity among the libraries, it is possible that this conformity represents a movement toward some optimal state. It has been shown that with the institution of user fees the searchers apparently tried to eliminate unnecessary cost to the patron by reducing on-line time and increasing off-line time. It is possible that this increasing conformity represents the same trend toward eliminating unnecessary identifiable costs. When the service was free, the searcher was at liberty to experiment with the service, to try different approaches to the same question, and generally vary the search procedure. With the introduction of search fees and the accompanying pressure on the searcher to perform effectively at the terminal, this variation and experimentation was no longer possible.

The data is not persuasive enough to allow any inferences about what this optimal level might be. But the greater similarity among the libraries tested argues for a greater generalizability of the result from these sample libraries to other libraries. Another library considering instituting such a service can be encouraged by the similarity of the values among these libraries despite their different populations, organizational structures, and means of advertising the search service to potential users. This leads one to believe that the results are of some value in predicting the influence of instituting on-line searching in another library.

Table 11

Significant Differences Between
Libraries for Selected Search Variables

Table 11a

Free Period

Library	Library		
	Santa Clara	San Mateo	San Jose
Redwood City	RI,ST, DF, TT, TC	ST, DF, TT, TC	ST, TT
Santa Clara	-	RI, ST, TC	RI, DF, F, TT
San Mateo	-	-	ST, DF, TC

Table 11b

Pay Period

Library	Library		
	Santa Clara	San Mateo	San Jose
Redwood City	RI, DP, TT	-	RI, DP, DF, TT, TC
Santa Clara	-	-	ST, DF, TC
San Mateo	-	-	DF

Note: The symbols for the variables are defined as follows: 81) RI-Reference Interview time, (2) DP-Dialog Library Preparation Time, (3) ST-Search Time at terminal, (4) DF-Dialog Library Follow-up Time, (5) F-Follow-Up Time with Patron, (6) TT-Total time for all search and search related tasks, (7) TC-Total Cost of Search.

SUMMARY AND CONCLUSIONS

This paper has extended the analysis of a previous paper which dealt with free online service, by investigating the costs during a pay period and statistically comparing the pay and free periods. We tested two hypotheses concerning (1) differences in the time and cost variables between the free and pay periods, and (2) differences in time and cost variables between pairs of libraries.

Concerning the first hypothesis, it was found that the primary effect of search fees is a slight increase in staff cost (approximately $.50 per search), and a decrease of $5.75 per search in retrieval service cost, and an increase of $2.99 in citation printing. This results in an overall decrease in cost of search from $28.68 to $26.44 in going from free to pay service.

Concerning the second hypothesis, it was found that there is greater conformity between pairs of libraries in the pay period than in the free period. Another library considering online search can be encouraged by the similarity of the values among these libraries despite their different populations, organizational structures, etc. The time and cost results should therefore be of value in predicting the effect of instituting online search in another library.

REFERENCES

1. Cooper, Michael D. and Nancy A. DeWath. "The Cost of On-Line Bibliographic Searching" Journal of Library Automation, 9.3 (September 1976) 195-209.

2. Cooper, Michael D. and Nancy A. DeWath. The Cost of On-Line Bibliographic Searching., Technical Report ACR-003-75-01 Applied Communication Research, Palo Alto, California, December 1975.

3. Kirk, Roger E. Experimental Design: Procedures for the Behavioral Sciences, Brooks/Cole Publishing Co., Belmont, California, 1968.

4. Summit, Roger K. and Oscar Firschein. Two year Interim Report: Investigation of the Public Library as a Linking Agent to Major Scientific, Educational, Social, and Environmental Data Bases. Information Systems Program, Lockheed Palo Alto Research Laboratory, Lockheed Missiles and Space Company, Inc. September 1976.

5. Summit, Roger K. and Oscar Firschein. Two year Interim Report: Investigation of the Public Library as a Linking Agent to Major Scientific, Educational, Social, and Environmental Data Bases. Annex I: Evaluation results, by Alice E. Ahlgren. Palo Alto, Information Systems Program, Lockheed Palo Alto Research Laboratory, Lockheed Missiles and Space Company, Inc. October 1976.

6. Summit, Roger K. and Oscar Firschein. Two year Interim Report: Investigation of the Public Library as a Linking Agent to Major Scientific, Educational, Social, and Environmental Data Bases. Annex II: Publicity Aspects. October, 1976 Information Systems Program, Lockheed Palo Alto Research Laboratory, Lockheed Missiles and Space Company, Inc. October, 1976.

7. Wanger, Judith, Carols A. Cuadra and Mary Fishburn. Impact of On-Line Retrieval Services: A Survey of Users, 1974-75. System Development Corporation, Santa Monica, California, 1976.

APPENDIX A

STATISTICAL TESTS

Comparisons of the means for the various hyotheses were performed using contrasts. To form a contrast, the initial observations of one search variable are recorded. The variable may be the time of cost of a reference interview, search preparation, or follow-up; or the total time for a search, the total number of off-line prints, or the data base connect charges. Define X_{LPSO} as the observed value for a variable for library L time period P (where the period is either the free or the pay period), staff member S, and observation O.

There are usually multiple observations of a variable for a particular staff member, and the mean of these $n_{LPS.}$ observations is given by

$$\bar{X}_{LPS.} = \sum_{O} X_{LPSO} / n_{LPS.}$$

and the standard deviation by

$$S_{LPS.} = \sqrt{\frac{\sum_{O} [X_{LPSO} - \bar{X}_{LPS.}]^2}{N_{LPS.}}}$$

The mean of a variable X for library L during time period P is given by

$$\bar{X}_{LP} = \frac{\sum_{S} n_{LPS.} \bar{X}_{LPS.}}{\sum_{S} n_{LPS.}}$$

This is simply the weighted average of each staff member's mean value for the varaible. Similarly, the standard error of the mean is given by

$$SE_{(\bar{X}_{LP..})} = \frac{\sum_{S} n_{LPS.} S^2_{LPS.}}{\sum (n_{LPS.})}$$

and the number of observation is

$$N_{LP} = \sum_{S} n_{LPS}$$

To compute the confidence interval for a contrast, (say the difference between the pay and free period values for a variable for library 1) the following is used:

$$\bar{X}_{11..} - \bar{X}_{12..} \pm t_{DUNN} \, SE_{(\bar{X}_{11..} - \bar{X}_{12..})}$$

where the standard error (SE) is defined as

$$SE_{(\bar{X}_{11..} - \bar{X}_{12..})} = \sqrt{SE^2_{\bar{X}_{11..}} - SE^2_{\bar{X}_{12..}}}$$

and the value of t_{DUNN} is given in a standard table (4, p. 551).

The appopriate value of the Dunn coefficient depends on the number of error degrees of freedom, the number of comparisons made, and the alpha level used. All tests were made at alpha = 0.05 per family of contrasts. The number of error degrees of freedom was assumed to be infinite. For comparison of the free versus the pay period, four contrasts ware calculated (one for each library) and the Dunn value used was 2.50. Comparisons of the libraries for the combined period involved six contrasts (four libraries, compared two at a time) and the Dunn coefficient was 2.64. Comparisons of pairs of libraries for the pay period (and then the free period) involved twelve contrasts. The Dunn value used as 2.86 (interpolated).

APPENDIX III

A STUDY OF REPEAT DIALIB USERS

A STUDY OF REPEAT USERS

Repeat users are those individuals who requested more than one search during the project. They provide an interesting group to study, since they obviously valued the search service enough to use it on more than one occasion. The repeat users were studied in three substudies. The first analyzed existing documents (search requests and followups from the first two years of the study). The second substudy was based on an additional followup questionnaire sent to year 1 and 2 repeat users during the third year of the study. The third substudy was an analysis of the search request forms from the third year of the study.

The results reported here are from all three substudies. Sections drawing on data from only years 1 and 2 are identified.

Repeat users are a significant percentage of all users.

	Year I	Year II	Year III	Total
# of searches*	1236	611	326	1573
# of repeat users	206	97	28	292
# of searches requested by repeat users	536	215	78	829
total # of users	906	493	286	1646
repeat/total users	23%	20%	9%	18%

This data shows that repeat usage dropped as the user charges increased. It also suggests, however, that the repeat users might have biased the user demographics and other data--particularly during the first two years--by being counted more than once.

Looking across the three years:

139 Repeat users requested searches only in Year 1
49 Repeat users requested searches only in Year 2
21 Repeat users requested searches only in Year 3
39 Repeat users requested searches only in Years 1 and 2
22 Repeat users requested searches only in Years 2 and 3
7 Repeat users requested searches only in Years 1 and 3
5 Repeat users requested searches in all three years

* Number of searchers taken from search request forms, rather than command summary sheets. (During the first and second year of the study the number of command summary sheets exceeded the number of search request forms filed.)

"Regular" users who stopped searching after fees were imposed are also interesting because they form a potential customer base for a tax-supported or subsidized service. Apparently they found the service of sufficient value to return to use it again, although they did not continue to use it once fees were imposed. Many of the one-time only users indicated that they would use a DIALIB service several times a year, but the "regulars" actually did use the service more than once. The novelty of on-line searching may have been the motivation for many of the one-time users.

The unspoken assumption of the above is that repeat use of DIALIB is equated with greater satisfaction with DIALIB. To measure this, we compared various measures of satisfaction, as returned by the users on the follow-up questionnaires between one-time users and repeat users in Years 1 and 2. Percentages of requestors reporting major, considerable, minor or no value to the searches conducted for them are shown for the two groups. It is apparent that repeat users indicated greater satisfaction with the value of the search.

	Repeaters	One-Timers
Major Value	28%	22%
Considerable Value	52%	41%
Minor Value	16%	28%
No Value	3%	6%

Follow-up Questionnaires Returned by Repeat Users

There were 209 follow-up questionnaires returned by repeat users in Years 1 and 2. The total number of individuals returning one or more questionnaires was 147. This represents a 56 percent response from the 264 repeaters--higher than the 33 percent response rate overall. Presumably, because of their higher satisfaction with their searches and their status as "regulars" this group was more willing to help out by returning the questionnaires. Also, they were mailed one questionnaire per search, so that they had more opportunity and encouragement to return at least one of the questionnaires they received. In fact, only 24 of the 183 repeat users returning questionnaires returned one for each search performed.

Number of Searches Conducted by Each Repeat User

The number of searches conducted are as follows:

1332	user(s)	conducted 1	search(es)
193	"	2	"
55	"	3	"
22	"	4	"
12	"	5	"
5	"	6	"
4	"	7	"
2	"	8	"
1	"	9	"
1	"	10	"
1	"	13	"
1	"	14	"
1	"	22	"

Of the 264 repeat users in Years 1 and 2, the really significant ones are those who requested searches at time intervals of greater than one month. Searches at such intervals indicate a continuing interest, rather than the slightly extended one-time shot of a group of searches conducted on the same day or separated by only a week or two. This group of "high-interest" repeaters numbers numbers 103, or 39 percent of the total. The least interesting group of repeat users are those who conducted a group of searches on the same day. There are 37 such users or 14 percent of the total. The other 47 percent conducted their searches within a maximum interval of 60 days. Presumably, searches on one day or within a fairly short span of time could have been students, working on a term paper or thesis, who submitted a number of requests based on a single topic of interest. When their need was satisfied, they did not continue to use the service.

The Intermediary

The librarian, in conducting a search, is acting as an intermediary between the client and the resource (the data bases). There is yet another kind of intermediary that was involved in the DIALIB project--the person who submitted requests from many users. This person was often employed as a company librarian. Also in the category of intermediaries we could place consultants, who are collecting information for the use of their clients, and researchers. We surmise that these intermediaries (classified as librarians, consultants and researchers) who deal in information for a living, will make up a large part of the group of repeat users. These people may be a good customer base for a public library retrieval service. On the other hand, if they are in the "for-profit" sector, why should they not subscribe directly to an online service, rather than use the tax-supported "free" public library?

The number and percentage of repeat users during Years 1 and 2 classified as intermediaries is shown for number of searches conducted below:

33%	of people	conducting 7	searches were intermediaries
20%	"	6	"
44%	"	5	"
19%	"	4	"
22%	"	3	"
15%	"	2	"

A second followup questionnaire was mailed out to three groups of repeat users. Group I consisted of individuals who used the search service more than once during the free period, but did not continue to use the service when partial fees were charged. Group II was made up of users of the Cupertino and Redwood City libraries who requested searches in Year II and/or in Year I. Group III included individuals who requested searches in Year II and/or in Year I from the San Jose and San Mateo libraries.

The sample sizes and response rates were:

	Mailed	Returned	%
Group I	124	53	43%
Group II	57	22	39%
Group III	29	12	41%

Overall, there were 87 responses out of 210 queries, or a response rate of 41 percent.*

The first question we posed to the repeat users was "Have you had occasion to use an online search service since the last time you used DIALOG in the public library?" The answers are summarized in the following chart:

	Responded	Have Used	Have Not Used
Group I	53	11	42
Group II	22	7	15
Group III	12	2	10

Access Points to Online Searching

For the smaller group of users (20 respondents or 23 percent of the total) who did continue using a search service, 6 respondents used the San Jose Public Library.

The access point most frequently used instead of the public library was another technical or special library. Those cited most often were:

Library	# of Users
Stanford University	3
University of California, Berkeley	3
NASA AMES	1
Naval Environmental Prediction Research Facility Library	1
California State Library	1

* Of the 210 questionnaires originally mailed, 33 were returned "addressee unknown", a not surprising result as in some cases our addresses were nearly three years old. Subtracting these 33 from the original 210 leaves a corrected sample of 177; with 87 responses, we have a response rate of 49 percent.

The second most frequently used access point was in in-house system, cited by seven respondents. Other access points included SMERC contracts and WESRAC in Los Angeles.

The advantages cited for these access points over the public library were cost (frequently, these services were free to the individual user), convenience ("more convenient for work-related purposes"; "need for more frequent access") and in one case, the opportunity for one skilled user to conduct her own searches.

Reasons for Failure to Use a Search Service

The most often-cited reason for non-use of search services has been "no need". Users indicated, for example, that they finished their theses, graduated, or completed their research project. (39 respondents)

The second most frequently cited reason was the expense, or "cost per unit of satisfaction" as one user put it.

A third reason was the perceived inconvenience or inadequacy of the service, including the feeling that library personnel should have been better trained, and the difficulty of locating full text of retrieved citations. (6 respondents) As one user put it:

> "Your average customer doesn't know what the hell to do with a bib. list or abstracts. Your A.C. wants to know what's happening--not where to go to find out about where to go, etc., etc."

One user felt coverage wasn't complete; another user indicated that to be comprehensive in his field, the data base would have needed to cover the last 15 years, rather than the past 4. One user cited the unavailability of GEO-REF, the data base used most often by his particular company.

A fourth reason for non-use of search services was the feeling that manual searches were, for most purposes, a good substitute for the computer-assisted search. Manual searches of ERIC, for example, were found to be as convenient as computer searches of the ERIC data base. One user commented that

> "hand searches still provide the best approach as searchers can delete or add suitable key words as progress is made."

(This can of course be done in an online search, the respondent obviously was unaware of this.)

Two users (from Group II) indicated that they have not used another search service because of "lack of knowledge of available resources." Presumably, had they known where to go to obtain search services, they would have made use of them.

Overwhelmingly, however, the response was "no need". Users of a search service appear to be motivated, usually, by a one-time not often recurring need.

Price Ranges

We asked users to estimate a price range "that they might be willing to pay for an online search". Figures 1 and 2 show the high and low end of the prices estimated. At the extremities, some respondents indicated that an online search was of no value to them; others suggested price ranges extending up to $1000. The estimates did not vary widely from group to group, although there was a slight tendency for groups II and III to suggest higher price ranges. The most interesting result is that the repeat users of Group I, users of the "free" service in Year I of the DIALIB experiment, do indicate a willingness to pay for online searching should they have a need for it in the future.

In answer to the question "under what circumstances would you be willing to go above the cost limits you described" most users stressed the lack of a guarantee that they will be satisfied in the results of the search. They do not know a priori how valuable the results of a search will be to them, but must wait until the print-outs are in hand, and the source documents collected. Under these circumstances, most users are unwilling to pay a high price for access to information of uncertain value.

One user indicated that he would pay more if there was a guarantee on the ease of finding documents. Another user indicated that although she was basically happy with DIALOG, she would value it more if it provided more comprehensive coverage of the journals she was interested in. She characterized herself as "...multidisciplinary. I work in the grey area between two disciplines."

Most users indicated that if they could pass on costs to a business, research grant, client, etc., they would be more able and willing to pay higher costs than they would as individuals.

Cost Options

There was universal agreement among our respondents that the public library was an appropriate place to offer online searching. Suggested financing options were more varied. Only 9 respondents in Group I, the "free" service users, advocated a continuation of free searching paid for out of the library's budget. One of the 9 commented, "We get to use encyclopedias just by paying our taxes." Interestingly, sixteen members of this group suggested that it would be appropriate for users to pay full charges. Overall, 30 respondents, or 34% of the total, advocated full

charges to users, 15 or 17 percent advocated library-supported service, and 26 or 30 percent suggested some combination of user charges and library support.

A variety of cost issues were raised by users. We list some of them here:

1. Several users suggested pay scales geared to the user's ability to pay. Many users, in all probability students themselves, suggested free searches for students. "Give students a break!" More generally, it was felt there should be "grants for special groups who are unable to pay".

2. A sharing arrangement was suggested in several cases whereby users would pay direct costs and libraries would pay indirect costs. Individual suggestions were as follows:

(a) "patron to pay for operator's time (or a charge to offset some of the costs). Library to contract for 'data base' as its 'service' as it provides information via books as a service"
(b) "combination of library support of staff time and patron support of on-line, printout costs"
(c) "since it is difficult in most public libraries to determine 'full charges' (overhead, etc.) it would seem appropriate that the patron pay all direct charges and a certain percentage of what the library could determine as indirect."
(d) patron should pay all costs above..."the charge for just being hooked on".

3. Even if the services were free, many users felt that a nominal fee should be charged to prevent abuse or frivolous uses of the service.

4. Alternative pricing methods, such as subscription rates, flat fees, and free searches but a charge for documents were suggested.

5. One user suggested a combination of user charges and library support

> "dependent upon the purpose of search--i.e., a student should do his own research or be willing to pay for it; a professional or private citizen should pay at least half; an employee of a public agency, who needs information for his work should be able to obtain it quickly, ideally, as a courtesy, not to be abused--and, at least, with some billing arrangement set up between the library and agency."

This user goes on to explain why their organization no longer uses DIALOG:

> "When we used DIALOG it was through Cupertino Library in the County system. Since we are a county agency, there was no charge for the service. Now we would have to pay cash, which is a very difficult and time-consuming procedure in our department. (We are not set up for billing or prepayment of the exact cost.) To date, none of our staff has requested searches of sufficient depth and complexity to make the result worth the cost and effort."

6. Several users stressed that they felt businesses should pay to use online searching, as it saves them the cost of contracting for the service themselves.

Personal Comments

Overall, comments and reactions from these users of two to three years ago were highly favorable. DIALOG was praised as:

> "an excellent service for individuals, students, researchers or even small companies that do not want the expense of training staff and expense of buying manuals, etc., and have occasional need for an online search."

DIALOG in the public library "reflects advancement of the highly technical society and the attempt of the library to keep up with it"; It "reflects well on the library's ability to keep up with what's going on in our highly technical society". "With the ever increasing volume of information that must be reviewed, a service like this is a MUST for an up and coming library system".

On the negative side, some users indicated that the service was too expensive, that it should have been advertised more, that the library personnel were not up to the demands of online searching, and that the data bases themselves were not sufficiently comprehensive.

Conclusions

It would appear that there is a small base of individuals who will use the online search services of a public library quite frequently. It appears that they do so for both convenience and economic factors. Among these repeat users are librarians and research support staff from many small and medium sized high technology firms.

Although repeat users indicate that they do not object to the cost of the online search, service usage dropped as the cost increased. Also, the clients appeared to become more critical as the cost increased.

It appears that these repeat users were generally quite sophisticated information users. They want information service and are willing to pay for it. However, they demand high quality and accuracy. If the library is unable to meet the demands of these clients, it seems clear they will obtain access to online search services elsewhere.

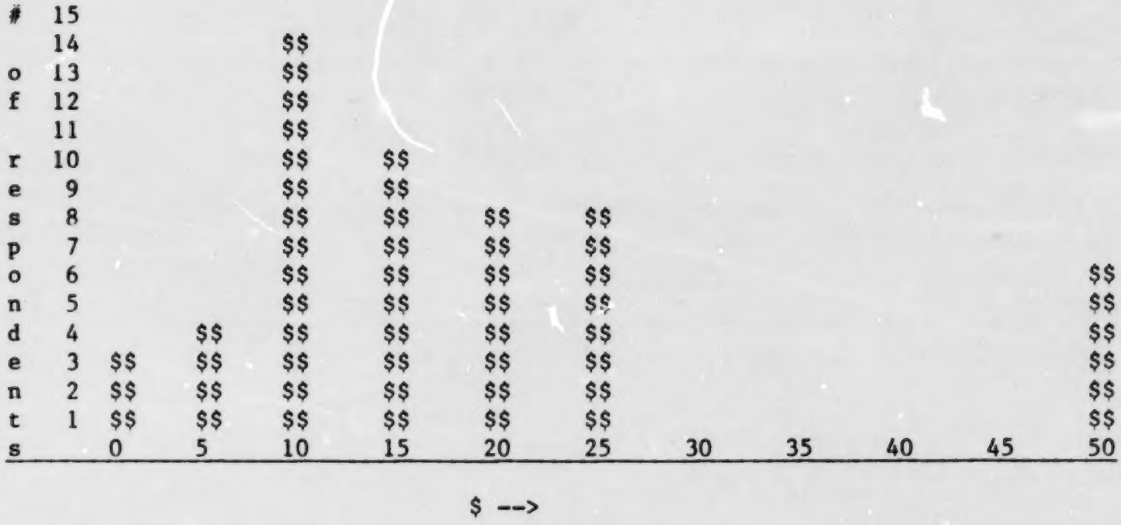


Fig. 1. Cost that users are willing to pay for an online search (high end)

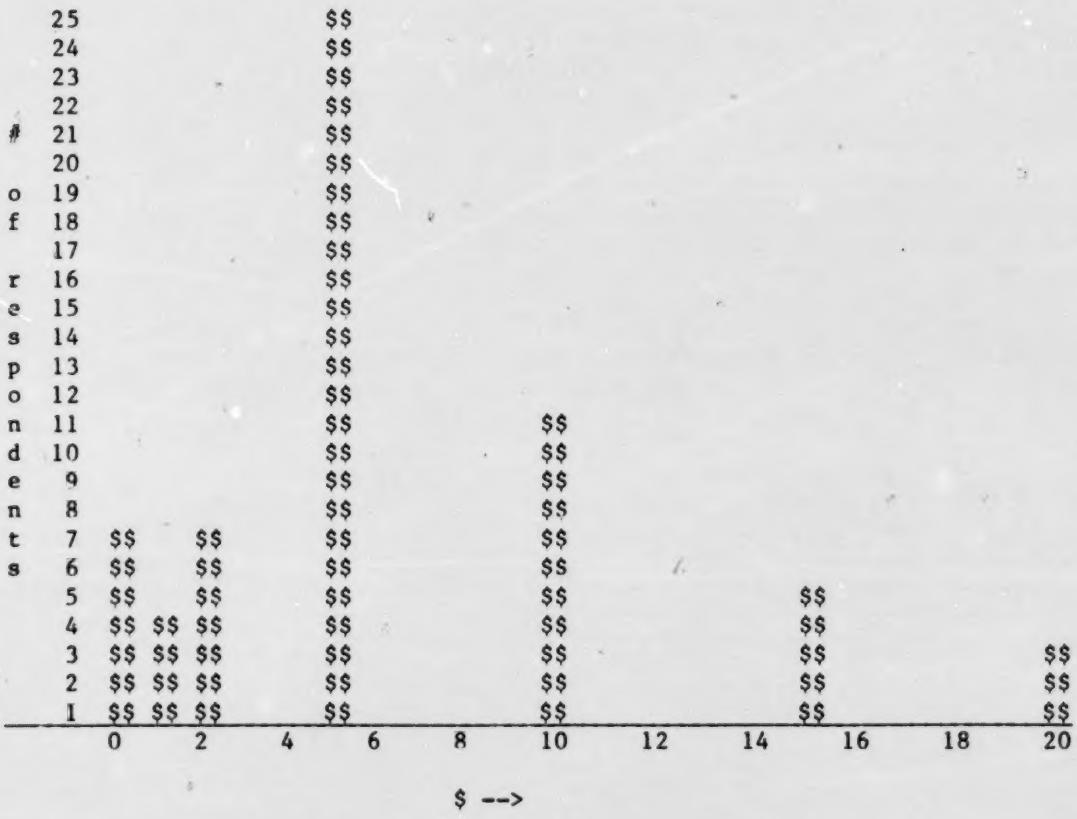


Fig. 2. Cost users are willing to pay for an online search (low end)

APPENDIX IV

LOCAL VS. NETWORK SEARCHING

Local vs. Network Searching

One question frequently raised during the three years of the DIALIB project was the possibility of problems arising when clients did not deal directly with the searching library, but submitted their requests through a branch library. Under this system the client dealt with a branch librarian who forwarded the search request to a central location for searching.

There was some concern that such indirect access might have an adverse impact on the client's satisfaction because of time delays and lack of direct contact with the searcher. This is an important concern since library networks are becoming more common and may prove an economical and effective means for providing access to online searching.

The San Mateo County Library received requests both directly, from "walk in" clients, and indirectly from branch libraries. A study was conducted to compare the responses of clients receiving search services in the two modes during the first two years of the project. The library handled a total of 165 indirect requests compared to 131 direct requests. Of the 296 requests, 49 followup questionaires were returned by each group.

Indirect requests were received from the following branches and organizations:

Branch or Organization	# of Requests
Public Health and Welfare (San Mateo Cty.)	52
Atherton (Branch)	45
Belmont (Branch)	12
Woodside (Branch)	10
Foster City (Branch)	10
CSC, Stanislaus (outside org.)	8
VA Hospital (Palo Alto)	7
San Mateo (City Library)	3
South San Francisco (City Library)	3
San Carlos (Branch)	3
Millbrae (Branch)	2
Half Moon Bay (Branch)	2
All Others	8
TOTAL	165

Comparison of the responses to questions on the followup questionnaires revealed no significant differences between the two groups. The San Mateo library did take longer to return search results to patrons than other libraries in the experiment* but it appeared to be equally slow in returning results to direct and indirect clients.

Days to Receive Citations	Indirect Requests	Direct Requests
1	0	1
2-7	20	13
8-14	19	24
15-21	8	7
22-42	6	3
	53**	48**

Perceived value of the search results was roughly similar for the two groups

Perceived Value	Indirect Requests	Direct Requests
Major Value	10	8
Considerable Value	27	21
Minor Value	7	14
No Value	5	5
No Response		1
TOTALS	49**	49**

Discussion

The San Mateo library had the lowest search volume of all libraries participating in the DIALIB experiment. The remote location of the library is at least partially responsible for the low volume of search requests, however it is interesting that the volume from branch libraries stayed so low. The San Mateo searchers noted that the branch libraries displayed little enthusiasm for the search service. This could be a result of:

lack of outreach and education from the search library,

"ego"- a desire to handle all requests in house,

limited staff time, or

an acknowledgement (or belief) that the data bases offered did not provide the kinds of services the branch libraries (or their patrons) wanted.

*During Year 1, San Jose and Santa Clara libraries provided 90 percent of their patrons with search results in less than one week, Redwood City 65 percent and San Mateo 52 percent.

**Differences in totals are caused by respondents listing time to receive search results for more than one search or by no resonse.